

ASARCO

PROTECTION AGENCY

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OCT 9 2003

MONTANA OFFICE



2058128 - R8 SDMS

Susan Zazzali
RCRA Project Manager
Montana Office
US EPA Region VIII
10 West 15th Street, Suite 3200
Helena, Montana 59626

October 8, 2003

SENT BY CERTIFIED MAIL
RETURN RECEIPT REQUESTED

**CONSENT DECREE
CIVIL ACTION NO. CV 98-3-H-CCL
EAST HELENA SITE
WORK PERFORMED IN SEPTEMBER 2003
PROGRESS REPORT #65**

Dear Ms. Zazzali:

On May 5, 1998, Asarco Incorporated (Asarco) and the United States Environmental Protection Agency (EPA) entered into a Consent Decree (Decree) to further the objectives of the Resource Conservation and Recovery Act (RCRA) and the Clean Water Act (CWA). Section XI of the Decree (Reporting: Corrective Action) requires Asarco to submit certified monthly progress reports to EPA which discuss the actions taken by Asarco in achieving compliance with the Decree. The reports are to be submitted to EPA no later than the twentieth (20th) day of the following month. The following describes only those activities that have occurred or are related to projects performed during September 2003. The historical actions taken by Asarco in achieving compliance with the Decree are contained in previous monthly progress reports.

- a. **Describe the actions, progress, and status of projects which have been undertaken pursuant to Part VII of the Decree;**

The Phase I RFI Site Characterization draft Report was submitted to EPA on April 1, 2003. Asarco awaits EPA's response to this document.

Three residential irrigation wells were sampled in September 2003 as part of the CERCLA post RI/FS long-term monitoring program. The Jensen and Yuricic residential irrigation wells were sampled on September 10, 2003 while the Nordstrom residential irrigation well was sampled on September 11, 2003. The residential irrigation well located at the Marcum home (water supply out-of-service) could not be sampled.

On September 9, 2003, Asarco forwarded to the Asarco environmental trustee one Contractor Claim Form (Randall Construction) for work that was performed in August 2003. On September 15, 2003, Asarco forwarded to the Asarco environmental trustee two Reimbursable Expense Claim Forms for work that was performed from March 2003 through August and May 2003 through July 2003 on RCRA Consent Decree RFI/IM and long-term monitoring.

On September 25, 2003, Jon Nickel and John Wardell agreed upon the date for the RCRA Consent Decree annual public meeting. This meeting is scheduled to take place on October 15, 2003 at 7:00 pm at the East Helena Volunteer Firehall. Public notices announcing the public meeting will be placed in the October 5, 2003 and October 12, 2003 Sunday editions of the Independent Record.

A summary of the correspondence transmitted as part of the East Helena Consent Decree in September 2003 is included in Attachment 1.

- b. Identify any requirements under the Part VII of the Decree that were not completed in a timely manner, and problems or anticipated problem areas affecting compliance with the Decree;**

During September 2003, there were no requirements that were not completed in a timely manner nor were there problems or anticipated problem areas that affect compliance with the Decree.

- c. Describe projects completed during the prior month, as well as activities scheduled for the next month;**

In accordance with the March 2000 Groundwater Source Control Interim Measures Design Analysis, Plans, and Specification report, the speiss handling area and the former acid plant sediment drying area are being inspected monthly with the last inspection occurring on September 4, 2003. This monthly inspection documented the condition of the interim measures. The inspection confirmed that all scheduled interim measures were in place.

Phase III Sparge Testing – Asarco completed the operation and monitoring of the sparge systems at the SPAR-1 and SPAR-3 sites in December 2002. The data obtained from this testing will be included as an addendum to the Phase I RFI Site Characterization draft Report.

CAMU Landfill - The construction of the CAMU landfill is complete. The Final Construction Report for the CAMU-Phase 1 Cell was hand-delivered to EPA on January 23, 2002. In accordance with the July 2000 CAMU Design Analysis Report (Operation and Maintenance Plan), the CAMU is being inspected monthly with the last inspection occurring on September 18, 2003. This monthly inspection documented the condition of the CAMU.

RCRA Facility Investigation (RFI) - The Phase I RFI Site Characterization draft Report was submitted to EPA on April 1, 2003.

d. Describes, and estimates the percentage of studies completed;

The original bench-scale testing program for the Phase III air sparge test is 100% complete. The testing has been expanded to include additional column tests. The additional testing is 100% complete. The sparge pilot test program is 100% complete.

The RFI groundwater modeling is 100% complete. The results of this modeling exercise have been included in the Phase I RFI Site Characterization draft Report.

The Interim Measures Work Plan Addendum (May 2002) and responses to EPA's July 1, 2002 comments are 100% complete.

The implementation (field investigations) of the Interim Measures Work Plan Addendum (May 2002, and its revisions) is 100% complete.

e. Describe and summarize all findings to date;

The details of past findings through August 2003 are described and summarized in previous monthly progress reports.

The SPAR-3 system continued to operate through December 17, 2002. Water quality data from December 2002 are pending and will be included as an addendum to the RFI draft Report.

f. Describe actions being taken to address problems;

There were no actions taken to address problems associated with the Decree.

g. Identify changes in key personnel during the period;

Asarco continues to use the services of Asarco Consulting Incorporated and Hydrometrics Incorporated to perform the various activities required under the Consent Decree. The Consent Decree activities will continue to be administrated under the direction of Robert Miller.

h. Include copies of the results of sampling and tests conducted and other data generated pursuant to work performed under Part VII of the Decree since the last Progress Report. Asarco may submit data that has been validated and confirmed by Asarco to supplement any prior submitted data. Updated validated and confirmed data shall be included with the RFI Report, if not delivered before;

Two validation summary packages are attached to this September 2003 monthly progress report. The "Validation Summary, Asarco East Helena Plant Post RI/FS Long Term Monitoring Project, Surface Water, Groundwater, and CAMU Wells Semi-Annul Sampling Event Inorganic Analyses (April -June 2003)" is attached to this progress report. The "Validation Summary, Asarco East Helena Interim Measures, East Helena Residential Groundwater Inorganic Analyses (May 2003)" is attached to this progress report.

- i. **Describe the status of financial assurance mechanisms, including whether any changes have occurred, or are expected to occur which might affect them, and the status of efforts to bring such mechanisms back into compliance with the requirements of this Decree.**

ASARCO is still unable, at this time, to make the required financial assurance demonstration using the mechanisms outlined in the East Helena Consent Decree. However, EPA agreed in paragraph 36 of the subsequent national consent decree (U.S. v. ASARCO and Southern Peru Holdings Corp., No. CV 02-2079-PHX-RCB (entered February 3, 2003)) to forego penalties for any noncompliance with financial assurance requirements in RCRA or CERCLA consent decrees (such as the East Helena decree) in calendar years 2003-2005. (Paragraph 35 of the decree also forgoes penalties for past inability to demonstrate financial assurance from December 1997 to the entry of the Decree.) ASARCO continues to try and improve its financial position and hopes to be able to make the required financial assurance demonstration in the future.

CERTIFICATION
PURSUANT TO U.S. v ASARCO INCORPORATED
(CV-98-3-H-CCL, USDC, D. Montana)

I certify under penalty of law that this document, September 2003 Progress Report and all attachments, were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

Signature D.E. McAllister
Name: Douglas E. McAllister
Title: Vice President
Date: October 8, 2003

CONSENT DECREE
EAST HELENA SITE
SEPTEMBER 2003 PROGRESS REPORT

SUMMARY OF CORRESPONDENCE
ATTACHMENT 1

DATE OF TRANSMITTAL	CORRESPONDENCE SENT FROM	CORRESPONDACE SENT TO	SUBJECT	RESPONSE
September 9, 2003	Jon Nickel	Daniel Silver	Contractor Claim Form for RCRA Consent Decree Activities	No Formal Response Required
September 15, 2003	Jon Nickel	Daniel Silver	Two Reimbursable Expense Claim Forms for RCRA Consent Decree Activities	No Formal Response Required

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VALIDATION SUMMARY
ASARCO EAST HELENA INTERIM MEASURES
EAST HELENA RESIDENTIAL GROUNDWATER
INORGANIC ANALYSES
MAY 2003

Prepared for:
Mr. John Nickel
ASARCO Incorporated
PO Box 1230
East Helena, MT 59635

Prepared by:
Linda L. Tangen
6900 Cherry Blossom Lane
Albuquerque, NM 87111

AUGUST 2003

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GLOSSARY OF TERMS

- CLP Contract Laboratory Program
- CRDL..... Contract Required Detection Limit
- IDL..... Instrument Detection Limit
- LCS Laboratory Control Sample
- PDLG..... Project Detection Limit Goal
- QC..... Quality Control
- RPD..... Relative Percent Difference
- SC Specific Conductivity
- SOW Statement of Work
- TSC..... Technical Service Center
- TDS..... Total Dissolved Solids

SUMMARY

East Helena residential well water (groundwater) samples were collected on May 1 and May 6, 2003 for the Asarco East Helena Facility Interim Measures project. Inorganic constituents for these samples were validated using Environmental Protection Agency (EPA) guidelines for data validation (EPA 2002) and the project work plan (Asarco 2002). Samples were analyzed by Asarco's Technical Services Center (TSC) in Salt Lake City, Utah. A summary of historical comparisons is located in Table 1 of Appendix 1; and the validated database is located in Appendix 2.

Data quality objectives for this project and the results for this sampling event were as follows:

- **Precision** is determined by field and laboratory duplicate sample results that are within control limits. The completeness objective for precision is 90% of the laboratory duplicate sample results within control limits. This was met as **100% of the field and laboratory duplicate results were within control limits.**
- **Accuracy** is determined by LCS and matrix spike sample results that are within control limits. The completeness objective for accuracy is 90% of the LCS and matrix spike sample results within control limits. **This objective was met as 100% of the LCS and matrix spike results were within control limits.**
- **Completeness** is calculated by the number of valid (not rejected) data per number of planned data, expressed as a percentage. The completeness goal for this project was 90%. **This goal was met as 100% of the planned data were analyzed and deemed valid. Completeness can also be expressed by the number of non-qualified data per measurements, which was 100%.**

All reported data for the Asarco Interim Measure's May 2003 sampling event are deemed valid and can be used for the purposes they were intended, as long as qualified data is used with appropriate caution, taking into account the possible bias and/or variance the flags indicate.

DATA VALIDATION REPORT

1. INTRODUCTION

- This validation applies to inorganic analytes from 15 (including one field duplicate) groundwater samples collected for the Asarco East Helena Interim Measures project. These samples were collected 5/1/03 and 5/6/03 from East Helena residential wells.
- Validation procedures used are generally consistent with:
 - USEPA CLP National Functional Guidelines for Inorganics Data Review (EPA 2002)
 - Work Plan – Interim Measures Work Plan Addendum (Asarco 2002)
 - Other
- Overall level of validation:
 - Contract Laboratory Program (CLP)
 - Standard – Field and laboratory quality control (QC) samples are reviewed; and samples associated with QC violations are flagged.
 - Visual

2. DELIVERABLES

- All laboratory document deliverables were present as specified in the CLP-Statement of Work (SOW) (EPA 1995), and/or the project contract.
 - Yes
 - No
- All documentation of field procedures was provided as required.
 - Yes
 - No

3. FIELD PROCEDURES

- All project required sites were visited
 - Yes
 - No – see notes

Notes: It was noted that well site LAMPING (316 Montana Avenue) is now owned by Bob Adkins. The following sites were not sampled:

SITE	REASON
NORDSTR	Well was winterized
ROMASKO/YURICIC	Well was winterized
GAGE	Homeowner couldn't be reached
GERM-GRASS	Well was winterized

- Field parameters were measured in accordance with the project work plan.
 Yes
 No
- Field instruments were calibrated daily and before measurements were collected
 Yes
 No
- Chains of Custodies (COCs) were properly filled out and signed by the field personnel.
 Yes
 No

4. FIELD BLANKS

Blanks: Please note that the highest blank value associated with any particular analyte is the blank value used for the flagging process.

DI, trip, rinsate, or any other field blanks have been carried out at the proper frequency (one rinsate blank per event).

- Yes
 No – see notes

Notes: A field rinsate blank was not submitted for this sampling event. However, all well sites have dedicated pumps, therefore this omission is inconsequential.

Reported results on the field blanks were less than the Project Detection Limit Goals (PDLGs).

- Yes
 No
 NA

5. FIELD DUPLICATES

Field duplicates have been collected at the proper frequency (one field duplicate per event).

- Yes
 No

Field duplicate relative percent differences (RPDs) were within the required control limits (RPD of 20% or less). If the sample or duplicate result is less or equal to five times the PDLG, the RPD criteria are not used. In these cases, the difference between the sample and the duplicate results must be within \pm the PDLG.

- Yes
 No

6. LABORATORY PROCEDURES

- **Laboratory procedures followed**

- CLP-SOW (EPA 1995)
- SW-846
- Methods for Chemical Analysis of Water and Wastes (EPA 1983)
- XRF Standard Operating Procedures
- Other

- **Holding times met**

- Yes
- No

- **Consistency with project requirements**

Analyses were carried out as requested.

- Yes
- No

Project specified methods were used.

- Yes
- No
- NA

7. DETECTION LIMITS

- Reporting detection limits met Project Detection Limit Goals (PDLGs).

- Yes
- No

8. LABORATORY BLANKS

Please note that the highest blank value associated with any particular analyte is the blank value used for the flagging process.

- **Method blanks**

Blanks were prepared and analyzed at the required frequency (one per batch or one per 20 samples, whichever is greater).

- Yes
- No

All the analytes in the blank were less than the PDLG.

- Yes
- No

9. LABORATORY MATRIX SPIKES

- A matrix spike sample (pre-digestion) was analyzed at the proper frequency (one per batch and/or matrix).

Yes

No

- Matrix spike recoveries were within the required control limits (75-125%).

Yes

No

10. LABORATORY DUPLICATES

- Laboratory duplicate samples were analyzed at the proper frequency (one per batch or one per 20 samples, whichever is greater).

Yes

No

- The laboratory duplicate relative percent differences (RPDs) were within the required control limits (RPD of 20% or less). If the sample or duplicate result is less or equal to five times the PDLG, the RPD criteria are not used. In these cases, the difference between the sample and the duplicate results must be within \pm the PDLG.

Yes

No

11. LABORATORY CONTROL STANDARDS

- The reference material used was of the correct matrix.

Yes

No

- LCS's were prepared and analyzed at the proper frequency (one per batch or one per 20 samples, whichever is greater).

Yes

No

- LCS recoveries were within the required control limits (80-120% or certified range).

Yes

No

12. INTERPARAMETER COMPARISON

- Lab pH vs. field pH.
- Lab Specific Conductivity (SC) vs. field SC

- X Total Dissolved Solids (TDS) vs. SC

Lab pH vs. Field pH: The RPDs for lab and field pH measurements were less than 20, with the exception of site JENSA2 (EHR-0305-100). The field pH was 5.73 and the lab pH was 7.5 (27 RPD). Both pH values were in line with historical values, therefore, no action was taken.

Lab SC vs. field SC: The RPDs for lab and field SC measurements were less than 20 for all samples collected for this sampling event.

TDS vs. Lab SC: The ratio of TDS to lab SC should lie between 0.55 and 0.75. In natural waters with high sulfate, the ratio may be much higher. This ratio is intended to be a check on the accuracy of the TDS and lab SC measurements. (It should be noted that these measurements are less accurate in dilute waters.) For this sampling event, TDS/SC ratios ranged from 0.67 to 0.92, which were appropriate for dilute waters.

13. HISTORICAL COMPARISON SUMMARY

Data for this sampling event were compared with previous sampling events. Sampling event results, which were more than three standard deviations from the historical mean, are listed in the summary. Refer to Table 1 in Appendix 1 for these comparisons.

14. DATA QUALITY OBJECTIVES

Project data quality objectives (DQOs).

Data quality objectives for this project are met when QC sample results are within the required control limits. The evaluation of field and laboratory QC samples gives a quantitative measure of precision and accuracy.

- **Precision** is determined by field and laboratory duplicate sample results that are within control limits. The completeness objective for precision is 90% of the laboratory duplicate sample results within control limits. This was met as 100% of the field and laboratory duplicate results were within control limits.
- **Accuracy** is determined by LCS and matrix spike sample results that are within control limits. The completeness objective for accuracy is 90% of the LCS and matrix spike sample results within control limits. This objective was met as 100% of the LCS and matrix spike results were within control limits.
- **Completeness** is calculated by the number of valid (not rejected) data per number of planned data, expressed as a percentage. The completeness goal for this project was 90%. This goal was met as 100% of the planned data were deemed valid. Completeness can also be expressed by the number of non-qualified data per measurements, which was 100%. Following is a detailed summary of the completeness for this sampling event.

Completeness Summary

Measurements				Completeness	
# Planned Measurements	Actual # of Measurements	# of Rejected Measurements	# of Flagged Measurements	Valid data per # Planned	Non-Flagged Data per Measurements
386	386	0	0	100%	100%

- In conclusion, all reported data for the Asarco Interim Measure's May 2003 sampling event are deemed valid and can be used for the purposes they were intended, as long as qualified data is used with appropriate caution, taking into account the possible bias and/or variance the flags indicate.

Data Validation Report by: Linda L. Tangen

Report Reviewed by: Robert Miller

REFERENCES

- Asarco Consulting Incorporated, 2002. Interim Measures Work Plan, East Helena Facility. Revised May.
- United States Environmental Protection Agency, 1983. Methods for Chemical Analysis of Water and Wastes. March.
- United States Environmental Protection Agency, 2002. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. July.
- United States Environmental Protection Agency, 1995. USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis. Document Number ILM04.0.

APPENDIX 1
TABLES

TABLE I. HISTORICAL COMPARISON SUMMARY

SUMMARY OF THE COMPARISON OF SAMPLING PERIOD DATA TO THE DATABASE PERIOD DATA, SHOWING PARAMETERS THAT ARE HIGHEST OR LOWEST OR THREE OR MORE STANDARD DEVIATIONS FROM THE MEAN OF THE DATABASE PERIOD AND THE RELATIONSHIP TO THESE DATA

DataMan Program

ASARCO, E.H. 0305 historical

SITE	SAMPLE DATE	COMPARISON DATABASE						RELATION TO		
		RESULT mg/L	PARAMETER	PERIOD	N	MIN (mg/L)	MEAN (mg/L)	MAX (mg/L)	STD DEVS FROM MEAN	DATABASE PERIOD
CARLSON	05/01/2003	8.87	OXYGEN (O) (FLD) DIS	06/24/2002-11/08/2002	2	0.87	1.8200	2.77	5.25	HIGHEST
		62.0	SULFATE (SO4)	07/06/2001-12/11/2002	5	40.0	45.0000	54.0	3.21	HIGHEST
JENSA2	05/01/2003	0.032	IRON (FE) DIS	05/14/1985-10/31/2002	6	<0.020	0.0227	0.026	3.17	HIGHEST
LAMPP1	05/01/2003	0.17	IRON (FE) DIS	11/02/1984-01/15/2002	3	0.023	0.0370	<0.050	9.83	HIGHEST
LEWING	05/01/2003	8.56	OXYGEN (O) (FLD) DIS	06/13/2001-06/24/2002	3	4.02	4.6067	5.35	5.82	HIGHEST
		0.067	MANGANESE (MN) DIS	06/13/2001-10/30/2002	3	<0.015	0.0183	0.022	> 10	HIGHEST
MOSIER	05/01/2003	5.95	PH (FLD)	06/24/2002-08/13/2002	2	7.10	7.1650	7.23	> 10	LOWEST
MOSIER	05/01/2003	59.0	SULFATE (SO4)	06/24/2002-08/13/2002	2	49.0	50.0000	51.0	6.36	HIGHEST

NOTES: All quantities in mg/L (Water) or mg/kg (Soil) unless noted. All results LABORATORY unless field (PLD) or calculated (CALC). N: Number of samples in comparison data set; 50% of data set must be above lab detection limit before mean, median, & SD calculation. A & R Flags were excluded from Statistics The detection limit was used in calculations.

APPENDIX 2
DATABASE

Sample Type: Private Well

SITE CODE	AMCHEM4	CARLSON	COX	DHULST
SAMPLE DATE	05/01/2003	05/01/2003	05/01/2003	05/01/2003
SAMPLE TIME	14:30	10:30	11:30	14:50
LAB	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030190010	L030190002	L030190007	L030190011
SAMPLE NUMBER	EHR-0305-109	EHR-0305-101	EHR-0305-106	EHR-0305-110
-- PHYSICAL PARAMETERS --				
OXYGEN (O) (FLD) DIS	4.33	8.87	5.44	12.48
PH (FLD)	6.16	5.92	5.8	6.3
PH	7.3	6.8	6.6	7.6
SC (UMHOS/CM AT 25 C)	318.0	309.0	563.0	607.0
SC (UMHOS/CM AT 25 C) (FLD)	264.0	259.0	467.0	502.0
TDS (MEASURED AT 180 C)	245.0	188.0	373.0	435.0
TOTAL SUSPENDED SOLIDS	<1.0	1.3	<1.0	<1.0
WATER TEMPERATURE (C) (FLD)	15.9	7.6	11.0	11.7
-- MAJOR CONSTITUENTS --				
CALCIUM (CA) DIS	35.0	32.0	56.0	60.0
MAGNESIUM (MG) DIS	8.3	7.1	12.0	16.0
SODIUM (NA) DIS	15.0	16.0	38.0	34.0
POTASSIUM (K) DIS	<5.0	<5.0	6.8	12.0
TOTAL ALKALINITY AS CACO ₃	114.0	82.0	100.0	165.0
BICARBONATE (HCO ₃)	139.0	100.0	122.0	201.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0	<2.0
SULFATE (SO ₄)	42.0	62.0	141.0	105.0
CHLORIDE (CL) DIS	4.8	4.9	17.0	26.0
-- METALS & MINOR CONSTITUENTS --				
ARSENIC (AS) DIS	<0.005	<0.005	<0.005	0.016
ARSENIC +3	<0.005	<0.005	<0.005	0.008
ARSENIC +5	<0.005	<0.005	<0.005	0.008
CADMIUM (CD) DIS	<0.001	<0.001	<0.001	<0.001
COPPER (CU) DIS	<0.004	0.4	0.035	0.006
IRON (FE) DIS	<0.02	0.029	0.043	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	<0.015	<0.015	<0.015
ZINC (ZN) DIS	<0.02	0.025	0.023	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; U1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

Sample Type: Private Well

SITE CODE	DATE	PLACE	GAGE	GERM-GRASS
SAMPLE DATE	05/01/2003	05/01/2003	05/06/2003	05/01/2003
SAMPLE TIME	15:10	10:45		
LAB	TSC-SLC	TSC-SLC	ASARCO	ASARCO
LAB NUMBER	L030190012	L030190003	0305-118	0305-119
REMARKS			NO SAMPLE	NO SAMPLE
OTHER INFO			Couldn't Recac	Not turned on
SAMPLE NUMBER	EHR-0305-111	EHR-0305-102	EHR-0305-118	EHR-0305-119

-- PHYSICAL PARAMETERS --

OXYGEN (O) (PLD) DIS	8.57	7.25
PH (PLD)	6.43	5.83
PH	7.1	6.9
SC (UMHOS/CM AT 25 C)	322.0	306.0
SC (UMHOS/CM AT 25 C) (PLD)	266.0	256.0
TDS (MEASURED AT 180 C)	204.0	189.0
TOTAL SUSPENDED SOLIDS	1.3	<1.0
WATER TEMPERATURE (C) (PLD)	8.3	10.0

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	34.0	34.0
MAGNESIUM (MG) DIS	7.6	7.5
SODIUM (NA) DIS	16.0	14.0
POTASSIUM (K) DIS	<5.0	<5.0
TOTAL ALKALINITY AS CACO ₃	85.0	87.0
BICARBONATE (HCO ₃)	104.0	106.0
CARBONATE AS CO ₃	<2.0	<2.0
SULFATE (SO ₄)	64.0	60.0
CHLORIDE (CL)	5.2	5.3

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	<0.005	<0.005
ARSENIC +3	<0.005	<0.005
ARSENIC +5	<0.005	<0.005
CADMIUM (CD) DIS	<0.001	<0.001
COPPER (CU) DIS	0.028	0.074
IRON (FE) DIS	0.075	0.074
LEAD (PB) DIS	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	<0.015
ZINC (ZN) DIS	<0.02	0.029

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (PLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

Sample Type: Private Well

SITE CODE	GERM-IN	HELPERT	JENSA2	LAMPP1
SAMPLE DATE	05/01/2003	05/01/2003	05/01/2003	05/01/2003
SAMPLE TIME	12:15	11:50	10:15	15:30
LAB	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030190009	L030190008	L030190001	L030190013
SAMPLE NUMBER	EHR-0305-108	EHR-0305-107	EHR-0305-100	EHR-0305-112

-- PHYSICAL PARAMETERS --

OXYGEN (O) (FLD) DIS	6.5	3.66	1.95	2.41
PH (FLD)	6.15	6.24	5.73	6.3
PH	7.1	6.8	7.5	6.9
SC (UMHOS/CM AT 25 C)	542.0	503.0	738.0	360.0
SC (UMHOS/CM AT 25 C) (FLD)	451.0	418.0	620.0	296.0
TDS (MEASURED AT 180 C)	342.0	314.0	531.0	230.0
TOTAL SUSPENDED SOLIDS	<1.0	<1.0	<1.0	5.2
WATER TEMPERATURE (C) (FLD)	11.2	11.9	11.4	11.1

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	48.0	58.0	92.0	40.0
MAGNESIUM (MG) DIS	9.7	13.0	21.0	9.3
SODIUM (NA) DIS	35.0	21.0	25.0	15.0
POTASSIUM (K) DIS	14.0	<5.0	6.3	<5.0
TOTAL ALKALINITY AS CACO ₃	100.0	120.0	125.0	96.0
BICARBONATE (HCO ₃)	122.0	146.0	153.0	117.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0	<2.0
SULFATE (SO ₄)	136.0	115.0	199.0	66.0
CHLORIDE (CL)	24.0	18.0	24.0	12.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	<0.005	<0.005	<0.005	<0.005
ARSENIC +3	<0.005	<0.005	<0.005	<0.005
ARSENIC +5	<0.005	<0.005	<0.005	<0.005
CADMIUM (CD) DIS	<0.001	<0.001	<0.001	<0.001
COPPER (CU) DIS	0.052	0.025	0.007	<0.004
IRON (FE) DIS	<0.02	<0.02	0.032	0.17
LEAD (PB) DIS	<0.005	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	<0.015	<0.015	0.043
ZINC (ZN) DIS	<0.02	<0.02	0.036	0.18

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

Sample Type: Private Well

SITE CODE	LEWING	MARCUM	MOSIER	MOSIER
SAMPLE DATE	05/01/2003	05/01/2003	05/01/2003	05/01/2003
SAMPLE TIME	16:00	11:15	11:00	11:05
LAB	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030190014	L030190006	L030190004	L030190005
REMARKS			DUPPLICATE	
SAMPLE NUMBER	EHR-0305-113	EHR-0305-105	EHR-0305-103	EHR-0305-104

-- PHYSICAL PARAMETERS --

OXYGEN (O) (FLD) DIS	8.56	4.26	6.2	
PH (FLD)	6.07	5.98	5.95	
PH	7.0	6.6	6.8	6.7
SC (UMHOS/CM AT 25 C)	533.0	279.0	298.0	298.0
SC (UMHOS/CM AT 25 C) (FLD)	435.0	242.0	249.0	
TDS (MEASURED AT 180 C)	349.0	185.0	187.0	193.0
TOTAL SUSPENDED SOLIDS	<1.0	1.4	<1.0	<1.0
WATER TEMPERATURE (C) (FLD)	11.0	10.4	10.6	

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	64.0	30.0	30.0	33.0
MAGNESIUM (MG) DIS	14.0	7.0	7.0	7.3
SODIUM (NA) DIS	22.0	14.0	13.0	14.0
POTASSIUM (K) DIS	<5.0	<5.0	<5.0	<5.0
TOTAL ALKALINITY AS CACO3	146.0	82.0	86.0	86.0
BICARBONATE (HCO3)	178.0	100.0	105.0	105.0
CARBONATE AS CO3	<2.0	<2.0	<2.0	<2.0
SULFATE (SO4)	112.0	54.0	54.0	59.0
CHLORIDE (CL)	6.3	4.2	3.8	3.9

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	<0.005	<0.005	<0.005	<0.005
ARSENIC +3	<0.005	<0.005	<0.005	<0.005
ARSENIC +5	<0.005	<0.005	<0.005	<0.005
CADMIUM (CD) DIS	<0.001	<0.001	<0.001	<0.001
COPPER (CU) DIS	<0.004	0.024	0.016	0.017
IRON (FE) DIS	<0.02	0.045	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	0.067	<0.015	<0.015	<0.015
ZINC (ZN) DIS	0.04	0.021	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; U1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

Sample Type: Private Well

SITE CODE	NORDSTR	ROMASKO/YURIC	STCLAIR
SAMPLE DATE	05/06/2003	05/06/2003	05/06/2003
SAMPLE TIME			15:30
LAB	ASARCO	ASARCO	TSC-SLC
LAB NUMBER	0305-115	0305-117	L030196001
REMARKS	NO SAMPLE	NO SAMPLE	
OTHER INFO	Not Turned On	Not Turned On	
SAMPLE NUMBER	EHR-0305-115	EHR-0305-117	EHR-0305-114

-- PHYSICAL PARAMETERS --

OXYGEN (O) (PLD) DIS	3.37
PH (PLD)	5.77
PH	6.8
SC (UMHOS/CM AT 25 C)	568.0
SC (UMHOS/CM AT 25 C) (PLD)	550.0
TDS (MEASURED AT 180 C)	368.0
TOTAL SUSPENDED SOLIDS	<1.0
WATER TEMPERATURE (C) (PLD)	10.4

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	47.0
MAGNESIUM (MG) DIS	9.4
SODIUM (NA) DIS	42.0
POTASSIUM (K) DIS	22.0
TOTAL ALKALINITY AS CACO ₃	98.0
BICARBONATE (HCO ₃)	120.0
CARBONATE AS CO ₃	<2.0
SULFATE (SO ₄)	164.0
CHLORIDE (CL)	16.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.088
ARSENIC +3	0.033
ARSENIC +5	0.057
CADMIUM (CD) DIS	<0.001
COPPER (CU) DIS	0.028
IRON (FE) DIS	0.041
LEAD (PB) DIS	<0.005
MANGANESE (MN) DIS	<0.015
ZINC (ZN) DIS	0.077

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (PLD) or calculated (CALC)
TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
R:Rejected.

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Page	Site Code	Site Name	Site Type	Elevation MP	Well Depth
1	AMCHEM4	American Chemet 4	Private Well	3885	160
1	CARLSON	Gail, 1	Private Well		
1	COX	Thurman, 303	Private Well		
1	DHULST	Manlove, 701	Private Well	3920	137
2	DUEL	Gail, 3	Private Well	3868.9	100
2	FLAGE	Gail, 9	Private Well	3865	32
2	GAGE	Groschell, 210 E.	Private Well		
2	GERM-GRASS	Clinton, 126 E. Irrigation	Private Well		
3	GERM-IN	Clinton, 126 E. Home	Private Well		
3	HELPERT	Porter, 407	Private Well	3885	180
3	JENSA2	Gail, 401	Private Well	3872.5	160
3	LAMPP1	Montana, 316 N.	Private Well	3920	46.5
4	LEWING	Lewis, 607	Private Well		
4	MARCUM	Gail, 203	Private Well		
4	MOSIER	Mosier	Private Well		
5	NORDSTR	Gail, 109	Private Well	3870	46
5	ROMASKO/YURICIC	Gail, 301	Private Well		
5	STCLAIR	Groschell, 107	Private Well	3810	65

M30346
LS-1

VALIDATION SUMMARY
ASARCO EAST HELENA
POST RI/FS LONG TERM MONITORING PROJECT
SURFACE WATER, GROUNDWATER AND CAMU WELLS
SEMI-ANNUAL SAMPLING EVENT
INORGANIC ANALYSES
APRIL - JUNE 2003

Prepared for:
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September 2003

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- Table 2. Summary of Qualified Data
- Table 3. Historical Comparison Summary

APPENDIX 2: DATABASE

GLOSSARY OF TERMS

CAMUCorrective Action Management Unit
CLPContract Laboratory Program
LCSLaboratory Control Sample
MS.....Matrix Spike
PBPrep Blank
PDLG.....Project Detection Limit Goal
QC.....Quality Control
RPD.....Relative Percent Difference
SCSpecific Conductivity
SOWStatement of Work
TSCTechnical Service Center
TSSTotal Suspended Solids
TDSTotal Dissolved Solids

SUMMARY

Semi-Annual Long-Term Monitoring water samples were collected April 30, 2003 through June 4, 2003. These samples, which included groundwater, surface water and Corrective Action Management Unit (CAMU) well water, were collected for the Asarco East Helena Post Remedial Investigation/Feasibility Study (Post-RI/FS) project. Inorganic constituents for these samples were validated using Environmental Protection Agency (EPA) guidelines for data validation (EPA 2002), the project work plan (Hydrometrics 2000), and scope of work (Asarco 2003). Samples were analyzed for inorganics by Asarco's Technical Services Center (TSC) in Salt Lake City, Utah. Tables containing Validation Code Definitions (Table 1), Summary of Qualified Data (Table 2), and the Historical Comparison Summary (Table 3) are located in Appendix 1. The validated database is located in Appendix 2.

Data quality objectives for this project are as follows:

- **Precision** is determined by number of field and laboratory duplicate sample results within quality control (QC) limits. This is quantitatively reported as the number of duplicate results within QC limits per total number of split and duplicate results, expressed as a percentage.
- **Accuracy** is determined by the blind field standard (BFS), matrix spike (MS) and laboratory control sample (LCS) results within QC control limits. This is quantitatively reported as the number of BFS, MS and LCS results within QC limits per total number of BFS, MS and LCS results, expressed as a percentage.
- **Completeness** is determined by the number of valid data per number of planned data. This is quantitatively reported as a percentage. The completeness goal for this project is 90%.

Data quality objectives were met as follows:

- **Precision** – 98.1% of the field duplicate and 100% of the laboratory duplicate results were within control limits. Overall precision was calculated at 99.1%.
- **Accuracy** - 100% of the BFS, matrix spike and LCS results were within control limits.
- **Completeness**– The completeness goal of 90% was met for this sampling event. Due to the omission of five DI blanks, and two rinsate blanks, in addition to the rejection of one field specific conductivity result, the completeness for sample collection and analysis was calculated at 95.6%.

In conclusion, with the exception of rejected data, all data collected April through June 2003 for the Asarco Post-RIFS sampling event are deemed acceptable and can be used for the purposes they were intended, providing qualified data are used with caution. Of the measured results, 99.3% can be used without qualification. Qualified data may indicate a bias or lack of precision. Data quality results are detailed in Section 14 of the Report Summary.

Data Validation Report by: Linda L. Tangen

Report Reviewed by: Bob Miller

DATA VALIDATION REPORT

1. INTRODUCTION

- This validation applies to inorganic analytes from 122 surface water, groundwater and CAMU well samples collected for the Asarco East Helena Post-RI/FS project. These samples were collected from April 30 through June 4, 2003 and included 7 field duplicates, 7 field blanks, and one field standard. In addition to sites sampled, 16 sites were measured for static water levels (SWLs). The following sites were not sampled or measured for SWLs due to dry conditions.

DRY SAMPLING SITES	DRY SWL ONLY SITES
DH-12	DH-28
DH-16	DH-61
DH-32	
DH-48	

- Validation procedures used are generally consistent with:
 - USEPA CLP National Functional Guidelines for Inorganics Data Review (EPA 2002)
 - USEPA CLP National Functional Guidelines for Organics Data Review
 - Work Plan and Scope of Work (Hydrometrics 2000 and Asarco 2003)
 - Other
- Overall level of validation:
 - Contract Laboratory Program (CLP)
 - Standard – Field and laboratory quality control (QC) samples are reviewed; and samples associated with QC violations are flagged.
 - Visual

2. DELIVERABLES

- All laboratory document deliverables were present as specified in the CLP-Statement of Work (SOW) (EPA 2001), and/or the project contract.
 - Yes
 - No
- All documentation of field procedures was provided as required.
 - Yes
 - No

3. FIELD PROCEDURES

- All project required sites were visited
 - Yes
 - No
- Field parameters were measured in accordance with the project work plan.
 - Yes
 - No
- Field instruments were calibrated daily and before measurements were collected.
 - Yes
 - No
- Chains of Custodies (COCs) were properly filled out and signed by the field personnel.
 - Yes
 - No

4. FIELD BLANKS

Please note that the highest blank value associated with any particular analyte is the blank value used for the flagging process.

DI, trip, rinsate, or any other field blanks have been carried out at the proper frequency (one rinsate blank and one DI blank per 20 samples).

Yes

No – see notes

Notes: DI blanks were not submitted for 4/30/03, 5/30/03, 5/31/03, 6/2/03, and 6/4/03 (115 total measurements). Rinsate blanks were not submitted 6/1/03 and 6/3/03 (44 total measurements).

Reported results on the field blanks were less than the Project Detection Limit Goals (PDLGs).

Yes

No – see notes

NA

Notes: Associated samples (samples collected the same day as the blank) with results \leq 5 times the blank value and greater than the detection limit were flagged "UJ" to indicate a possible positive bias due to contamination. On the following page is a summary of blank results that exceeded the PDLG and or reporting limits.

Field Blank Detections

Blank Type	Sample Code	Sample Date	Analyte	Result (mg/L)	PDLG (mg/L)	# of Flags
Rinsate	EHC-0304-107	4/30/03	TDS ⁽¹⁾	40	10	0 ⁽²⁾
Rinsate	AEH-0306-119	5/30/03	TDS ⁽¹⁾	57	10	0 ⁽²⁾
Rinsate	AEH-0306-127	5/31/03	TDS ⁽¹⁾	43	10	0 ⁽²⁾
DI	AEH-0306-159	6/1/03	TDS ⁽¹⁾	45	10	0 ⁽²⁾
			TSS ⁽³⁾	1.6	1.0	0 ⁽²⁾
			Arsenic ⁺³	0.008	0.005	0 ⁽⁴⁾
			Arsenic ⁺³	0.008	0.005	0 ⁽⁴⁾
			Copper (dis)	0.005	0.004	0 ⁽⁴⁾
Rinsate	AEH-0306-177	6/2/03	TDS ⁽¹⁾	32	10	0 ⁽²⁾
			SC (lab) ⁽⁵⁾	12	10	0 ⁽²⁾
			Bicarbonate	7.3	2	0 ⁽²⁾
			Alkalinity	7.3	2	0 ⁽²⁾
DI	AEH-0306-184	6/3/03	TDS ⁽¹⁾	57	10	0 ⁽²⁾
			Bicarbonate	5	2	0 ⁽²⁾
			Alkalinity	5	2	0 ⁽²⁾
Rinsate	AEH-0306-206	6/4/03	TDS ⁽¹⁾	33	10	0 ⁽²⁾
			SC (lab) ⁽⁵⁾	11	10	0 ⁽²⁾
			Bicarbonate	5	2	0 ⁽²⁾
			Alkalinity	5	2	0 ⁽²⁾
			TSS ⁽³⁾	4.8	1.0	0 ⁽²⁾

Notes: 1) TDS = total dissolved solids

2) Parameter is innately imprecise at low-level concentrations. Associated results are not normally flagged for low-level exceedances.

3) TSS = Total Suspended Solids

4) All associated sample results were > 5 times the blank concentration or less than the detection limit.

5) SC = Specific Conductivity

5. FIELD DUPLICATES

Field duplicates have been collected at the proper frequency (one field duplicate per 20 samples).

Yes

No

Field duplicate relative percent differences (RPDs) were within the required control limits (RPD of 20% or less). If the sample or duplicate result is less than or equal to five times the PDLG, the RPD criteria are not used. In these cases, the difference between the sample and the duplicate results must be within \pm the PDLG.

Yes

No – see notes on the following page

Notes: Associated samples (samples collected the same day as the blank) with results similar in matrix to the duplicate were flagged "J4" to indicate a possible variance. Following, is a summary of duplicate results that exceeded the QC limits.

Site	Sample # /Duplicate #	Sample Date	Analyte	Original Result (mg/L)	Dup Result (mg/L)	PDLG (mg/L)	RPD / DIFF (mg/L)	# of Flags
DH-23	AEH-0306-151	6/1/03	TSS Arsenic ⁺⁵	6.4	5.2	1.0	20.7 RPD	0*
	AEH-0306-152			0.12	0.21	0.005	54.6%	7
DH-24	AEH-0306-172	6/2/03	Copper (dis)	0.027	0.015	0.004	0.012 Diff	16
	AEH-0306-173							

Notes: * Parameter is innately imprecise at low-level concentrations. Associated results are not normally flagged for low-level exceedances.

6. BLIND FIELD STANDARD (BFS)

- The reference material used was of the correct matrix.

Yes – see notes
 No

Notes: The following field standard was used: trace metals - ERA Lot# P090500.

- Standards were submitted to the laboratory at the proper frequency (one sampling per event).

Yes
 No

- Standard recoveries were within the required control limits (80-120% or certified range).

Yes
 No

7. LABORATORY PROCEDURES

- Laboratory procedures followed

CLP-SOW (EPA 2001)
 SW-846 (EPA 1986)
 Methods for Chemical Analysis of Water and Wastes (EPA 1983)
 XRF Standard Operating Procedures
 Other

- Holding times met

Yes
 No

- **Consistency with project requirements**
Analyses were carried out as requested.
 Yes
 No

Project specified methods were used.
 Yes
 No
 NA

8. DETECTION LIMITS

- Reporting detection limits met Project Detection Limit Goals (PDLGs).
 Yes
 No - see notes

Notes: Sulfate and alkalinity/bicarbonate reporting limits (both, 2 mg/L) were greater than their respective PDLGs (both, 1 mg/L). However, all non-blank sample results for these parameters were well above the reporting limit.

9. LABORATORY BLANKS

Please note that the highest blank value associated with any particular analyte is the blank value used for the flagging process.

- **Method blanks**
Blanks were prepared and analyzed at the required frequency (one per batch or one per 20 samples, whichever is greater).
 Yes
 No

All the analytes in the blank were less than the PDLG (and/or reporting limits).
 Yes
 No

10. LABORATORY MATRIX SPIKES

- A matrix spike sample (pre-digestion) was analyzed at the proper frequency (one per batch and/or matrix).
 Yes
 No
- Matrix spike recoveries were within the required control limits (75-125%).
 Yes
 No

11. LABORATORY DUPLICATES

- Laboratory duplicate samples were analyzed at the proper frequency (one per batch or one per 20 samples, whichever is greater).

Yes
 No

- The laboratory duplicate relative percent differences (RPDs) were within the required control limits (RPD of 20% or less). If the sample or duplicate result is less than or equal to five times the PDLG, the RPD criteria are not used. In these cases, the difference between the sample and the duplicate results must be within \pm the PDLG.

Yes
 No

12. LABORATORY CONTROL STANDARDS

- The reference material used was of the correct matrix.

Yes
 No

- LCS's were prepared and analyzed at the proper frequency (one per batch or one per 20 samples, whichever is greater).

Yes
 No

- LCS recoveries were within the required control limits (80-120% or certified range).

Yes
 No

13. INTERPARAMETER COMPARISON

Lab pH vs. Field pH.

Lab Sodium Conductivity (SC) vs. Field SC

Total Dissolved Solids (TDS) vs. Lab SC

Lab pH vs. Field pH: Seven sites reported lab and field pH values that had RPD values greater than 20. It was noted that most of the laboratory pH values were greater than field pH values for this sampling event, which may indicate a possible systematic error. When this sampling event's pH values were compared to historical pH values, a clear systematic problem could not be determined. Therefore, no action was taken. On the following page is a summary of samples with RPD values greater than 20:

Lab pH vs. Field pH

Site	Sample Code	Sample Date	Field pH	Lab pH	RPD	Action
DH-7	AEH-0306-130	5/31/03	6.44	8.0	21.6%	None
DH-39	AEH-0306-138	5/31/03	5.53	7.0	23.5%	None
DH-42	AEH-0306-179	6/2/03	5.98	7.6	23.9%	None
DH-53	AEH-0306-120	5/31/03	5.65	7.4	26.8%	None
EH-101	AEH-0306-199	6/4/03	5.83	7.6	26.4%	None
MW-1	AEH-0306-100	5/30/03	5.83	7.8	28.9%	None
STW-7	AEH-0306-167	6/2/03	4.79	3.8	23.1%	None

Lab SC vs. Field SC: Twelve sites reported lab and field SC values that had RPD values greater than 20. All SC data were accepted without qualification except site MW-1. Due to comparisons with this site's TDS result and historical data, the field SC result was flagged with "R" to indicate that the datum was rejected. Following is a summary of samples with RPD values greater than 20:

Site	Sample Code	Sample Date	Field SC (umhos/cm)	Lab SC (umhos/cm)	RPD	Action
APSD-3	AEH-0306-114	5/30/03	835	675	21.2%	None
DH-18	AEH-0306-156	6/1/03	357	282	23.5%	None
DH-19R	AEH-0306-140	6/1/03	693	507	31.0%	None
DH-2	AEH-0306-216	6/4/03	598	475	22.9%	None
DH-22	AEH-0306-131	5/31/03	906	736	20.7%	None
DH-45	AEH-0306-116	5/30/03	721	574	22.7%	None
DH-59	AEH-0306-139	5/31/03	705	507	32.7%	None
EH-101	AEH-0306-199	6/4/03	648	526	20.8%	None
EH-51	AEH-0306-200	6/4/03	782	631	21.4%	None
EH-62	AEH-0306-204	6/4/03	445	354	22.8%	None
EH-64	AEH-0306-214	6/4/03	898	727	21.0%	None
MW-1	AEH-0306-100	5/30/03	431	3600	157.2%	Rejected Field SC

TDS vs. Lab SC: The ratio of TDS to lab SC should lie between 0.55 and 0.75. In natural waters with high sulfate, the ratio may be much higher. This ratio is intended to be a check on the accuracy of the TDS and lab SC measurements. (It should be noted that these measurements are less accurate in dilute waters.) All TDS/SC ratios were in line for this sampling event.

14. HISTORICAL COMPARISON SUMMARY

Data for the April through June 2003 sampling event were compared with previous sampling events. Sampling event results, which were more than three standard deviations from the historical mean, are listed in the summary. Refer to Table 1 in Appendix 1 for these comparisons. Note that most the metals and major constituents for site EH-109 were

historically high, and the all of the major constituents and dissolved zinc for site STW-9 were historically low.

15. DATA QUALITY OBJECTIVES

Project data quality objectives (DQOs).

Data quality objectives for this project are met when QC sample results are within the required control limits. The evaluation of field and laboratory QC samples gives a quantitative measure of precision and accuracy.

- Precision is determined by field and laboratory duplicate sample results that are within control limits. Following is a summary of this sampling event's precision.

QC Sample	Results Measured	Results Out of QC Limits	Results Within QC Limits	% Within QC Limit
Field Dup	159	3	156	98.1%
Lab Dup	172	0	172	100%
Total	331	3	328	99.1%

Notes: *A split sample was not submitted for this sampling event.

- Accuracy is determined by BFS, MS sample, and LCS results that are within control limits. Following is a summary of this sampling event's accuracy

QC Sample	Results Measured	Results Out of QC Limits	Results Within QC Limits	% Within QC Limit
BFS	7	0	7	100%
MS Sample	122	0	122	100%
LCS	158	0	158	100%
Total	287	0	287	100%

- Completeness is calculated by the number of valid (not rejected) data per number of planned data, expressed as a percentage. The completeness goal for the Asarco Post-RI/FS project is 90%. This goal was met for the April through June 2003 sampling event. Completeness can also be expressed by the number of non-qualified data per number of measurements. Following is a detailed summary of the completeness for this sampling event.

# of Planned Data	Actual # of Meas.	# of Rejected Data	# of Data Not Rejected	Valid Data per # Planned	# of Qualified Data	# of Meas. Data Not Qualified	Non-Qualified Data per # of Meas.
3623	3464 ⁽¹⁾	1 ⁽²⁾	3463	95.6%	24	3440	99.3%

Notes: 1) Five DI blanks (115 analytes) and two rinsate blanks (44 analytes) were not submitted for analysis.

2) One field SC was rejected.

- **In conclusion**, with the exception of rejected data, all data collected April through June 2003 for the Asarco Post-RI/FS sampling event are deemed acceptable and can be used for the purposes they were intended, providing the qualified data are used with caution. Qualified data may indicate a bias or lack of precision.

REFERENCES

- Asarco 2003. Letter to John Wardell, EPA, RE: East Helena Scope of Work – 2003 and Monitoring Program. April 30.
- Hydrometrics 2000. RCRA Facility Investigation Quality Assurance Project Plan, East Helena Facility. December.
- United States Environmental Protection Agency, 1983. Methods for Chemical Analysis of Water and Wastes. Document Number 600/4-79-020. Revised March.
- United States Environmental Protection Agency, 1986. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. Document Number EPA 530/SW-846. 3rd Ed – 4 Vols. November.
- United States Environmental Protection Agency, 2001. USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis. Document Number ILM05.2. December.
- United States Environmental Protection Agency, 2002. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. July.

APPENDIX 1

TABLES

TABLE 1.
DATA VALIDATION CODES AND DEFINITIONS

<u>CODE</u>	<u>DEFINITION</u>
J	The associated numerical value is an estimated quantity because quality control criteria were not met.
UJ	Blank contamination. Indicates a possible high bias and/or false positive. The associated value is an estimate.
R	Quality control indicates that the data are unusable (compound may or may not be present). Resampling and/or reanalysis are necessary for verification.
E	Estimated. (Not an EPA code.)
A	Anomalous data.. No apparent explanation for discrepancy in data. Applied based on historic results and on comparisons with other results for the same sample (not an EPA code.).

TABLE 2. SUMMARY OF QUALIFIED DATA

East Helena RI/FS

April - June 2003

Site Code	Sample No	Lab No	Sample Date	Parameter	Result (mg/L)	Flag	QC Type	Exceedances
DH-9	AEH-0306-154	L030244014	06/01/2003	ARSENIC +5	0.12	J4	Field Dup	54.6 RPD
DH-17	AEH-0306-162	L030244020	06/02/2003	COPPER (DIS)	<0.004	UJ4	Field Dup	0.012 mg/L Diff
DH-18	AEH-0306-156	L030244016	06/01/2003	ARSENIC +5	<0.005	UJ4	Field Dup	54.6 RPD
DH-23	AEH-0306-151	L030244011	06/01/2003	ARSENIC +5	0.12	J4	Field Dup	54.6 RPD
DH-23	AEH-0306-152	L030244012	06/01/2003	ARSENIC +5	0.21	J4	Field Dup	54.6 RPD
DH-24	AEH-0306-172	L030245010	06/02/2003	COPPER (DIS)	0.027	J4	Field Dup	0.012 mg/L Diff
DH-24	AEH-0306-173	L030245011	06/02/2003	COPPER (DIS)	0.015	J4	Field Dup	0.012 mg/L Diff
DH-35	AEH-0306-149	L030244009	06/01/2003	ARSENIC +5	<0.005	UJ4	Field Dup	54.6 RPD
DH-36	AEH-0306-160	L030244019	06/01/2003	ARSENIC +5	<0.005	UJ4	Field Dup	54.6 RPD
DH-49	AEH-0306-174	L030245012	06/02/2003	COPPER (DIS)	<0.004	UJ4	Field Dup	0.012 mg/L Diff
DH-50	AEH-0306-164	L030245002	06/02/2003	COPPER (DIS)	0.007	J4	Field Dup	0.012 mg/L Diff
DH-51	AEH-0306-163	L030245001	06/02/2003	COPPER (DIS)	0.009	J4	Field Dup	0.012 mg/L Diff
DH-53	AEH-0306-179	L030245016	06/02/2003	COPPER (DIS)	0.007	J4	Field Dup	0.012 mg/L Diff
DH-58	AEH-0306-155	L030244015	06/01/2003	ARSENIC +5	<0.005	UJ4	Field Dup	54.6 RPD
DH-63	AEH-0306-176	L030245014	06/02/2003	COPPER (DIS)	0.007	J4	Field Dup	0.012 mg/L Diff
DH-64	AEH-0306-170	L030245008	06/02/2003	COPPER (DIS)	0.004	J4	Field Dup	0.012 mg/L Diff
DH-67	AEH-0306-175	L030245013	06/02/2003	COPPER (DIS)	0.009	J4	Field Dup	0.012 mg/L Diff
MW-1	AEH-0306-100	L030242001	05/30/2003	SC (UMHOS/CM) (FLD)	3600.0	R	Interparameter/Historical Comp.	
SPAR-3	AEH-0306-171	L030245009	06/02/2003	COPPER (DIS)	0.004	J4	Field Dup	0.012 mg/L Diff
STW-1	AEH-0306-169	L030245007	06/02/2003	COPPER (DIS)	<0.004	UJ4	Field Dup	0.012 mg/L Diff
STW-4	AEH-0306-168	L030245006	06/02/2003	COPPER (DIS)	0.011	J4	Field Dup	0.012 mg/L Diff
STW-7	AEH-0306-167	L030245005	06/02/2003	COPPER (DIS)	0.027	J4	Field Dup	0.012 mg/L Diff
STW-8	AEH-0306-166	L030245004	06/02/2003	COPPER (DIS)	0.007	J4	Field Dup	0.012 mg/L Diff
STW-9	AEH-0306-165	L030245003	06/02/2003	COPPER (DIS)	0.007	J4	Field Dup	0.012 mg/L Diff

TABLE 3. HISTORICAL COMPARISON SUMMARY

SUMMARY OF THE COMPARISON OF SAMPLING PERIOD DATA TO THE DATABASE PERIOD DATA, SHOWING PARAMETERS THAT ARE HIGHEST OR
OR LOWEST OR THREE OR MORE STANDARD DEVIATIONS FROM THE MEAN OF THE DATABASE PERIOD AND THE RELATIONSHIP TO THESE DATA

DataMan Program

ASARCO, E.H. 0306 EHPRI

SITE	SAMPLE DATE	RESULT mg/L	PARAMETER	COMPARISON				RELATION TO		
				DATABASE PERIOD	N	MIN (mg/L)	MEAN (mg/L)	MAX (mg/L)	STD DEVS FROM MEAN	
APSD-13	05/30/2003	5.5 ARSENIC +3 <0.005 ARSENIC +5		11/17/1993-11/13/2002 11/17/1993-11/13/2002	19 19	<0.004 2.5	0.4976 5.8557	2.7 9.53000	5.14 3.36	HIGHEST LOWEST
DH-2	06/04/2003	475.0 SC (UMHOS/CM AT 25 C) (FLD) 70.0 CHLORIDE (CL)		01/18/1985-11/15/2002 01/18/1985-11/15/2002	37 34	489 6.6	587.5297 17.0088	685 25.	3.03 > 10	LOWEST HIGHEST
DH-9	06/01/2003	1050.0 DEPTH TO WATER LEVEL (FEET)		11/25/1986-05/08/2001	26	DRY	11.3263	13.5	> 10	HIGHEST
DH-10A	06/03/2003	150.0 CALCIUM (CA) DIS		05/07/1998-11/16/2002	10	8.9	40.5800	103.0	3.24	HIGHEST
DH-20	05/31/2003	11.0 TOTAL SUSPENDED SOLIDS		11/33/1987-11/13/2002	8	14.	16.6250	20	3.18	LOWEST
DH-21	06/01/2003	8.06 PH (FLD)		04/27/1987-11/15/2002	35	7.85	10.7169	11.8	3.64	
DH-23	06/01/2003	6.4 TOTAL SUSPENDED SOLIDS		11/25/1987-11/15/2002	7	<1.	2.0143	4.8	3.17	HIGHEST
DH-29	05/31/2003	433.0 TOTAL SUSPENDED SOLIDS 85.0 CALCIUM (CA) DIS		12/18/1987-11/13/2002 12/18/1987-11/13/2002	8 12	45.0 121	98.7500 148.4167	154 181	7.95 3.11	HIGHEST LOWEST
DH-31	06/01/2003	2720.0 SC (UMHOS/CM AT 25 C) 1924.0 TDS (MEASURED AT 180 C) 9.8 WATER TEMPERATURE (C) (FLD)		12/17/1999-11/18/2002 12/17/1999-11/18/2002 12/17/1999-11/18/2002	7 7 7	3780.0 2782.0 12.5	4170.0000 3090.1429 14.7143	4800. 3615.0 16.6	3.30 3.34 3.30	LOWEST LOWEST LOWEST
DH-35	06/01/2003	7.35 DEPTH TO WATER LEVEL (FEET) 11.5 WATER TEMPERATURE (C) (FLD) 288.0 SODIUM (NA) DIS		12/17/1999-11/15/2002 12/17/1999-11/15/2002 12/17/1999-11/15/2002	7 7 7	25.02 13.3 398.0	27.4586 14.0571 490.7143	29.80 14.9 585.0	4.23 4.23 3.37	LOWEST LOWEST LOWEST
DH-36	06/01/2003	5.98 PH (FLD)		12/16/1999-11/18/2002	7	7.02	7.4229	8.22	3.45	LOWEST
DH-37	06/01/2003	36.0 TOTAL SUSPENDED SOLIDS		05/02/2001-11/15/2002	4	24.0	27.5000	30.0	3.21	HIGHEST
DH-38	06/01/2003	7310.0 SC (UMHOS/CM AT 25 C) 8300.0 SC (UMHOS/CM AT 25 C) (FLD) 5247.0 TDS (MEASURED AT 180 C) 1610.0 SODIUM (NA) DIS 1584.0 TOTAL ALKALINITY AS CACO3 1083.0 BICARBONATE (HCO3) 91.0 ARSENIC (AS) DIS 72.0 ARSENIC +3 19.0 ARSENIC +5		12/16/1999-11/18/2002 12/16/1999-11/18/2002 12/16/1999-11/18/2002 12/16/1999-11/18/2002 12/16/1999-11/18/2002 12/16/1999-11/18/2002 12/16/1999-11/18/2002 12/16/1999-11/18/2002	7 7 7 7 7 7 7 7	3100.0 3200 2147.0 537.0 129.0 157.0 12.0 13. <0.005	4001.4286 4097.7143 3004.5714 797.4286 405.0000 438.1429 57.143 26.4286 2.7414	5040. 6260 3807. 1100.0 848.0 805.0 55.0 48.0 14.	4.41 3.36 4.18 3.91 5.07 3.04 4.66 3.53 3.23	HIGHEST HIGHEST HIGHEST HIGHEST HIGHEST HIGHEST HIGHEST HIGHEST HIGHEST
DH-40	05/31/2003	2.5 TOTAL SUSPENDED SOLIDS		05/04/2001-11/14/2002	4	45.0	66.7500	87.0	3.72	LOWEST
DH-42	05/31/2003	7.0 PH 70.0 TOTAL ALKALINITY AS CACO3 85.0 BICARBONATE (HCO3)		12/16/1999-11/14/2002 12/16/1999-11/14/2002 12/16/1999-11/14/2002	7 7 7	6.0 27. 33	6.3143 39.5714 48.1429	6.5 46.0 56.0	3.02 4.01 4.01	HIGHEST HIGHEST HIGHEST
DH-43	05/31/2003	26.0 TOTAL ALKALINITY AS CACO3 32.0 BICARBONATE (HCO3) 5.8 ARSENIC +3		12/16/1999-11/14/2002 12/16/1999-11/14/2002 12/16/1999-11/14/2002	7 7 7	<1.0 <1.0 0.022	7.9286 9.6286 1.1620	17.0 21.0 2.4	3.75 3.70 4.29	HIGHEST HIGHEST HIGHEST
DH-44	05/31/2003	2340.0 SC (UMHOS/CM AT 25 C) 2390.0 SC (UMHOS/CM AT 25 C) (FLD) 1900.0 TDS (MEASURED AT 180 C) 112.0 MAGNESIUM (MG) DIS 955.0 SULFATE (SO4) 1.5 ARSENIC +3 0.2 ARSENIC +5		12/16/1999-11/14/2002 12/16/1999-11/14/2002 12/16/1999-11/14/2002 12/16/1999-11/14/2002 12/16/1999-11/14/2002 12/16/1999-11/14/2002 12/16/1999-11/14/2002	7 7 7 7 7 7 7	980.0 877 684.0 39.0 262.0 0.078 0.97	1334.4286 1280.2857 984.5714 57.0000 417.5714 0.5026 1.2814	1750. 1730 1399. 80.0 630. 0.91 1.7	3.18 3.44 3.31 3.26 3.85 3.06 3.40	HIGHEST HIGHEST HIGHEST HIGHEST HIGHEST HIGHEST LOWEST
DH-49	06/02/2003	183.0 TOTAL ALKALINITY AS CACO3 223.0 BICARBONATE (HCO3)		12/15/1999-11/13/2002 12/15/1999-11/13/2002	6 6	122. 149	135.5000 165.3333	155.0 189.0	3.78 3.78	HIGHEST HIGHEST

NOTES: All quantities in mg/L (Water) or mg/kg (Soil) unless noted. All results LABORATORY unless field (FLD) or calculated (CALC).

N: Number of samples in comparison data set; 50% of data set must be above lab detection limit before mean, median, & SD calculation.

A & R Flags were excluded from Statistics

The detection limit was used in calculations.

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OR LOWEST OR THREE OR MORE STANDARD DEVIATIONS FROM THE MEAN OF THE DATABASE PERIOD AND THE RELATIONSHIP TO THESE DATA

DataMan Program

ASARCO, E.H. 0306 EHPR1

SITE	SAMPLE DATE	RESULT mg/L	PARAMETER	COMPARISON DATABASE PERIOD				RELATION TO DATABASE		
				N	MIN (mg/L)	MEAN (mg/L)	MAX (mg/L)	STD DEVS FROM MEAN	PERIOD	
DH-52	06/03/2003	1.5 ARSENIC +3 0.007 COPPER (CU) DIS	12/15/1999-11/16/2002 12/15/1999-11/16/2002	7 7	0.006 <0.004	0.3894 0.0049	0.87 0.006	3.06 3.11	HIGHEST HIGHEST	
DH-53	06/02/2003	154.0 TOTAL ALKALINITY AS CACO3 188.0 BICARBONATE (HCO3)	12/15/1999-11/16/2002 12/15/1999-11/16/2002	7 7	102.0 124.0	118.5714 144.5714	132.0 161.0	3.68 3.64	HIGHEST HIGHEST	
DH-57	06/01/2003	0.23 OXYGEN (O) (FLD) DIS 168.0 TOTAL ALKALINITY AS CACO3 205.0 BICARBONATE (HCO3) 1.0 ARSENIC +5	07/11/2001-11/16/2002 07/11/2001-11/16/2002 07/11/2001-11/16/2002 07/11/2001-11/16/2002	2 2 2 2	2.80 138.0 168.0 0.50	3.3950 143.0000 174.5000 0.5500	3.99 148.0 181.0 0.60	3.76 3.54 3.32 6.36	LOWEST HIGHEST HIGHEST HIGHEST	
DH-58	06/01/2003	2.2 ARSENIC +3	07/11/2001-11/16/2002	4	0.66	0.9075	1.3	4.28	HIGHEST	
DH-59	05/31/2003	0.33 CADMIUM (CD) DIS 0.047 COPPER (CU) DIS 2.2 ZINC (ZN) DIS	07/11/2001-11/16/2002 07/11/2001-11/16/2002 07/11/2001-11/16/2002	4 4 4	0.013 <0.004 0.56	0.0670 0.0048 0.8575	0.14 0.007 1.3	4.62 > 10 3.74	HIGHEST HIGHEST HIGHEST	
DH-60	05/31/2003	3070.0 SC (UMHOS/CM AT 25 C) 2649.0 TDS (MEASURED AT 180 C) 93.0 MAGNESIUM (MG) DIS 0.67 ARSENIC +3 0.008 COPPER (CU) DIS	07/11/2001-11/14/2002 07/11/2001-11/14/2002 07/11/2001-11/14/2002 07/11/2001-11/14/2002 07/11/2001-11/14/2002	4 4 4 4 4	2150.0 1803.0 70.0 0.14 <0.004	2260.0000 1900.7500 74.2500 0.2550 0.0043	2460.0 2068.0 83.0 0.41 0.005	5.63 6.48 3.17 3.66 7.50	HIGHEST HIGHEST HIGHEST HIGHEST HIGHEST	
DH-64	06/02/2003	6.5 IRON (FE) DIS 2.0 ZINC (ZN) DIS	07/11/2001-11/05/2002 07/11/2001-11/05/2002	9 9	9.6 3.2	12.7333 3.8889	16.0 4.6	3.46 4.24	LOWEST LOWEST	
DH-67	06/02/2003	1.36 OXYGEN (O) (FLD) DIS 12.4 WATER TEMPERATURE (C) (FLD) 194.0 CHLORIDE (CL)	10/07/2002-11/16/2002 10/07/2002-11/16/2002 10/07/2002-11/16/2002	2 2 2	3.28 11.5 135.0	3.3650 11.5500 143.5000	3.45 11.6 152.0	> 10 > 10 4.20	LOWEST HIGHEST HIGHEST	
EH-109	06/04/2003	2130.0 SC (UMHOS/CM AT 25 C) 2040.0 SC (UMHOS/CM AT 25 C) (FLD) 1533.0 TDS (MEASURED AT 180 C) 105.0 CALCIUM (CA) DIS 30.0 MAGNESIUM (MG) DIS 122.0 TOTAL ALKALINITY AS CACO3 149.0 BICARBONATE (HCO3) 119.0 CHLORIDE (CL) 7.5 ARSENIC +3 <0.001 CADMIUM (CD) DIS 0.86 ZINC (ZN) DIS	11/05/2002-11/05/2002 11/05/2002-11/05/2002 11/05/2002-11/05/2002 11/05/2002-11/05/2002 11/05/2002-11/05/2002 11/05/2002-11/05/2002 11/05/2002-11/05/2002 11/05/2002-11/05/2002 11/05/2002-11/05/2002 11/05/2002-11/05/2002	7 7 7 7 7 7 7 7 7 7	2220.0 2190 1588.0 112.0 31.0 132.0 161.0 159.0 11.0 0.002 0.94	2232.8571 2234.2857 1603.1429 112.2857 31.8571 135.4286 165.1429 167.5714 11.1429 0.0021 0.9800	2250.0 2260 1618.0 113.0 32.0 139.0 170.0 174.0 12.0 0.003 1.0	7.45 8.73 5.25 > 10 4.91 5.36 4.99 9.60 9.64 3.02 5.55	LOWEST LOWEST LOWEST LOWEST LOWEST LOWEST LOWEST LOWEST LOWEST LOWEST LOWEST	
EH-111	06/04/2003	33.0 MAGNESIUM (MG) DIS 0.86 ARSENIC +3 0.007 COPPER (CU) DIS	11/11/2002-11/11/2002 11/11/2002-11/11/2002 11/11/2002-11/11/2002	5 5 5	27.0 0.21 0.005	28.0000 0.3220 0.0052	29.0 0.49 0.006	7.07 4.76 4.02	HIGHEST HIGHEST HIGHEST	
EH-113	06/04/2003	26.81 DEPTH TO WATER LEVEL (FEET) 1270.0 SC (UMHOS/CM AT 25 C) (FLD)	10/24/2002-11/17/2002 10/24/2002-11/17/2002	4 4	22.60 1497	23.0750 1508.5000	23.55 1520	6.81 > 10	HIGHEST LOWEST	
EH-114	06/03/2003	32.41 DEPTH TO WATER LEVEL (FEET) 0.1 OXYGEN (O) (FLD) DIS 1650.0 SC (UMHOS/CM AT 25 C) (FLD)	10/15/2002-11/17/2002 10/15/2002-11/17/2002 10/15/2002-11/17/2002	4 4 4	27.31 3.68 1325	27.9450 4.3900 1342.5000	28.58 5.10 1360	6.09 5.23 > 10	HIGHEST LOWEST HIGHEST	
EH-115	06/04/2003	34.66 DEPTH TO WATER LEVEL (FEET) 1480.0 SC (UMHOS/CM AT 25 C) (FLD) 11.8 WATER TEMPERATURE (C) (FLD)	10/24/2002-11/16/2002 10/24/2002-11/16/2002 10/24/2002-11/16/2002	2 2 2	29.32 768 10.8	29.9100 773.0000 10.9500	30.50 778 11.1	5.69 > 10 4.01	HIGHEST HIGHEST HIGHEST	
EH-50	06/03/2003	0.28 ARSENIC (AS) DIS 0.17 ARSENIC +5	11/07/1986-11/16/2002 11/07/1986-11/16/2002	39 38	<0.0040 <0.0040	0.0376 0.0355	0.23 0.12	4.47 3.54	HIGHEST HIGHEST	

NOTES: All quantities in mg/L (Water) or mg/kg (Soil) unless noted. All results LABORATORY unless field (FLD) or calculated (CALC).

N: Number of samples in comparison data set, 50% of data set must be above lab detection limit before mean, median, & SD calculation.

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ASARCO, B.H. 0306 EHPRI

DataMan Program

SITE	SAMPLE DATE	RESULT mg/L	PARAMETER	COMPARISON			RELATION TO			
				DATABASE PERIOD	N	MIN (mg/L)	MEAN (mg/L)	MAX (mg/L)	STD DEVS FROM MEAN	
EH-54	06/04/2003	180.0	SC (UMHOS/CM AT 25 C) (FLD)	11/24/1986-11/17/2002	35	239.2	294.0200	399	3.38	LOWEST
EH-57A	06/03/2003	45.0	TOTAL SUSPENDED SOLIDS	12/03/1987-11/17/2002	8	<1.0	4.0625	12.0	9.43	HIGHEST
EH-58	06/03/2003	24.0	CHLORIDE (CL)	12/08/1986-11/17/2002	34	<2.0	5.1882	11.	9.03	HIGHEST
EH-64	06/04/2003	10.8	WATER TEMPERATURE (C) (FLD)	07/10/2001-11/17/2002	4	11.4	11.8750	12.2	3.16	LOWEST
EH-65	06/04/2003	11.0	WATER TEMPERATURE (C) (FLD)	07/10/2001-11/17/2002	4	11.8	12.0250	12.3	4.62	LOWEST
EH-100	06/03/2003	9.7	ARSENIC +3	02/02/1987-11/12/2002	16	<0.008	2.1657	6.3	3.76	HIGHEST
		0.006	CADMIUM (CD) DIS	11/11/1986-11/12/2002	17	0.001	0.0020	0.004	4.62	HIGHEST
		20.0	MANGANESE (MN) DIS	11/11/1986-11/12/2002	16	0.940	6.9168	13.0	3.97	HIGHEST
		1.2	ZINC (ZN) DIS	11/11/1986-11/12/2002	17	0.018	0.3057	0.65	4.77	HIGHEST
EH-106	06/04/2003	1.09	OXYGEN (O) (FLD) DIS	10/07/2002-11/11/2002	8	0.38	0.5150	0.90	3.60	HIGHEST
		0.006	COPPER (CU) DIS	10/07/2002-11/11/2002	8	<0.004	0.0044	0.005	3.14	HIGHEST
MW-4	05/30/2003	464.0	SC (UMHOS/CM AT 25 C)	11/16/2000-11/15/2002	5	482.0	501.0000	511.0	3.34	LOWEST
PPC-3A	04/30/2003	6.6	pH	11/07/1996-11/07/2002	13	6.8	7.7769	8.2	3.14	LOWEST
PPC-5	04/30/2003	6.5	pH	11/06/1984-11/06/2002	36	6.7	7.8158	9.0	3.19	LOWEST
PPC-7	04/30/2003	6.6	pH	11/05/1984-11/06/2002	35	7.0	7.8109	8.51	3.32	LOWEST
PPC-8	04/30/2003	6.4	pH	11/05/1984-11/06/2002	35	6.8	7.7849	8.4	3.71	LOWEST
STW-1	06/02/2003	17.0	POTASSIUM (K) DIS	05/10/2000-11/13/2002	6	12.0	13.0000	15.0	3.16	HIGHEST
		25.0	ARSENIC (AS) DIS	05/10/2000-11/13/2002	30	32.0	45.7667	55.0	4.30	LOWEST
		0.39	IRON (FE) DIS	05/10/2000-11/13/2002	21	0.13	0.2200	0.34	3.43	HIGHEST
STW-4	06/02/2003	1718.0	TDS (MEASURED AT 180 C)	12/20/2000-11/13/2002	5	1970.0	2021.6000	2068.0	7.98	LOWEST
STW-7	06/02/2003	9.4	POTASSIUM (K) DIS	08/10/2001-11/13/2002	3	12.0	12.6667	13.0	5.66	LOWEST
STW-8	06/02/2003	2550.0	SC (UMHOS/CM AT 25 C)	08/10/2001-06/06/2002	3	2770.0	2793.3333	2810.0	> 10	LOWEST
		1811.0	TDS (MEASURED AT 180 C)	08/10/2001-09/04/2002	3	1998.0	2015.6667	2031.0	> 10	LOWEST
		2.6	TOTAL SUSPENDED SOLIDS	08/10/2001-06/06/2002	2	75.0	84.0000	93.0	6.40	LOWEST
		430.0	SODIUM (NA) DIS	08/10/2001-06/06/2002	2	552.0	553.5000	555.0	> 10	LOWEST
		155.0	CHLORIDE (CL)	08/10/2001-06/06/2002	2	209.0	212.0000	215.0	> 10	LOWEST
		0.75	ZINC (ZN) DIS	08/10/2001-07/25/2002	13	0.089	0.2115	0.28	> 10	HIGHEST
STW-9	06/02/2003	13.0	POTASSIUM (K) DIS	08/10/2001-11/13/2002	3	16.0	17.0000	18.0	4.00	LOWEST
		152.0	CHLORIDE (CL)	08/10/2001-11/13/2002	3	184.0	192.0000	196.0	5.77	LOWEST
		12.0	ARSENIC (AS) DIS	08/10/2001-11/13/2002	25	14.0	20.1200	23.0	3.26	LOWEST

NOTES: All quantities in mg/L (Water) or mg/kg (Soil) unless noted. All results LABORATORY unless field (FLD) or calculated (CALC).
N: Number of samples in comparison data set; 50% of data set must be above lab detection limit before mean, median, & SD calculation.

APPENDIX 2
DATABASE

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1	APSD-1	APSD-1	Groundwater	3918.16	11.75
1	APSD-2	APSD-2	Groundwater	3919.80	18.0
1	APSD-3	APSD-3	Groundwater	3919.21	12.5
2	APSD-4	APSD-4	Groundwater	3921.95	14.0
2	APSD-7	APSD-7	Groundwater	3920.58	16
2	APSD-8	APSD-8	Groundwater	3920.52	15
3	APSD-9	APSD-9	Groundwater	3923.62	16
3	APSD-10	APSD-10	Groundwater	3923.14	16
3	APSD-11	APSD-11	Groundwater	3923.36	16
4	APSD-12	APSD-12	Groundwater	3920.78	15.5
4	APSD-13	APSD-13	Groundwater	3923.95	23
4	DH-66	DH-66	Groundwater		
5	DH-1	DH-1	Groundwater	3907.77	50
5	DH-2	DH-2	Groundwater	3915.31	65.5
5	DH-3	DH-3	Groundwater	3946.05	54
6	DH-4	DH-4	Groundwater	3914.42	23
6	DH-5	DH-5	Groundwater	3917.98	17
6	DH-6	DH-6	Groundwater	3886.37	25
7	DH-7	DH-7	Groundwater	3895.74	28.5
7	DH-8	DH-8	Groundwater	3913.39	49
7	DH-9	DH-9	Groundwater	3893.29	11.5
8	DH-10A	DH-10A	Groundwater	3883.28	10
8	DH-11	DH-11	Groundwater	3910.31	29
8	DH-12	DH-12	Groundwater	3906.60	30
9	DH-13	DH-13	Groundwater	3907.43	45
9	DH-14	DH-14	Groundwater	3912.81	46
9	DH-15	DH-15	Groundwater	3886.96	50
10	DH-16	DH-16	Groundwater	3901.35	28
10	DH-17	DH-17	Groundwater	3902.27	41
10	DH-18	DH-18	Groundwater	3907.33	63.5
11	DH-19R	DH-19R	Groundwater	3916.09	25
11	DH-20	DH-20	Groundwater	3927.50	31
11	DH-21	DH-21	Groundwater	3907.52	29
12	DH-22	DH-22	Groundwater	3921.79	34
12	DH-23	DH-23	Groundwater	3912.67	20
12	DH-24	DH-24	Groundwater	3896.21	35
13	DH-27	DH-27	Groundwater	3908.81	29
13	DH-28	DH-28	Groundwater	3908.73	36
14	DH-29	DH-29	Groundwater	3918.79	17
14	DH-30	DH-30	Groundwater	3911.61	22
14	DH-31	DH-31	Groundwater	3910.92	28
15	DH-32	DH-32	Groundwater	3914.94	30
15	DH-33	DH-33	Groundwater	3911.42	30
15	DH-34	DH-34	Groundwater	3909.17	30
16	DH-35	DH-35	Groundwater	3911.14	29.5
16	DH-36	DH-36	Groundwater	3904.68	31
16	DH-37	DH-37	Groundwater	3913.26	30
17	DH-38	DH-38	Groundwater	3911.49	25
17	DH-39	DH-39	Groundwater	3928.50	30
17	DH-40	DH-40	Groundwater	3926.14	20
18	DH-41	DH-41	Groundwater	3924.28	27
18	DH-42	DH-42	Groundwater	3923.13	34
18	DH-43	DH-43	Groundwater	3924.87	36
19	DH-44	DH-44	Groundwater	3927.62	29.4
19	DH-45	DH-45	Groundwater	3921.60	15
19	DH-46	DH-46	Groundwater	3917.87	14
20	DH-47	DH-47	Groundwater	3918.88	15
20	DH-49	DH-49	Groundwater	3900.63	34
20	DH-50	DH-50	Groundwater	3901.37	34
21	DH-51	DH-51	Groundwater	3900.96	34
21	DH-52	DH-52	Groundwater	3885.43	17
21	DH-53	DH-53	Groundwater	3889.25	17
22	DH-54	DH-54	Groundwater	3886.77	27
22	DH-55	DH-55	Groundwater	3969.30	93
22	DH-56	DH-56	Groundwater	3954.57	85
23	DH-57	DH-57	Groundwater	3911.98	28
23	DH-58	DH-58	Groundwater	3896.38	24
23	DH-59	DH-59	Groundwater	3912.54	25
24	DH-60	DH-60	Groundwater	3919.06	35
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25	DH-65	DH-65	Groundwater	3942.30	70
26	DH-67	DH-67	Groundwater		
26	EH-103	EH-103	Groundwater		
26	EH-104	EH-104	Groundwater		
27	EH-107	EH-107	Groundwater		
27	EH-109	EH-109	Groundwater		
27	EH-110	EH-110	Groundwater		
28	EH-111	EH-111	Groundwater		
28	EH-112	EH-112	Groundwater		
28	EH-113	EH-113	Groundwater		
29	EH-114	EH-114	Groundwater		
29	EH-115	EH-115	Groundwater		
29	EH-50	EH-50	Groundwater	3885.83	45
30	EH-51	EH-51	Groundwater	3876.56	30
30	EH-52	EH-52	Groundwater	3877.35	13
30	EH-53	EH-53	Groundwater	3869.31	35
31	EH-54	EH-54	Groundwater	3866.57	18
31	EH-57A	EH-57A	Groundwater	3881.79	45
31	EH-58	EH-58	Groundwater	3884.46	31
32	EH-59	EH-59	Groundwater	3873.24	18
32	EH-60	EH-60	Groundwater	3884.86	29
32	EH-61	EH-61	Groundwater	3886.22	45
33	EH-62	EH-62	Groundwater	3871.59	46.5
33	EH-63	EH-63	Groundwater	3874.95	35
33	EH-64	EH-64	Groundwater	3879.24	35
34	EH-65	EH-65	Groundwater	3878.68	35
34	EH-100	EH-100	Groundwater	3886.25	60
34	EH-101	EH-101	Groundwater	3876.81	45
35	EH-102	EH-102	Groundwater	3877.04	35
35	EH-106	EH-106	Groundwater		
35	MW-1	MW-1/CAMU	Groundwater	3949.65	68
36	MW-2	MW-2/CAMU	Groundwater	3942.52	66
36	MW-3	MW-3/CAMU	Groundwater	3937.55	50
36	MW-4	MW-4/CAMU	Groundwater	3943.52	72
37	MW-5	MW-5/CAMU	Groundwater	3952.51	71
37	MW-6	MW-6/CAMU	Groundwater	3934.54	40
37	MW-7	MW-7/CAMU	Groundwater	3959.99	60
38	SPAR-1	Sparge 1	Groundwater		
38	SPAR-2	Sparge 2	Groundwater		
38	SPAR-3	Sparge 3	Groundwater		37
39	STW-1	#1 Sparge Test Well	Groundwater	3902.212	40
39	STW-2	#2 Sparge Test Well	Groundwater	3900.92	40
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40	STW-4	#4 Sparge Test Well	Groundwater	3900.60	40
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40	STW-6	#6 Sparge Test Well	Groundwater	3900.80	40
41	STW-7	#7 Sparge test well	Groundwater	3902.118	40
41	STW-8	#8 Sparge test well	Groundwater	3902.034	40
41	STW-9	#9 Sparge test well	Groundwater	3900.65	40
42	DI BLANK	DI BLANK	Quality Control		
42	SSTD	STANDARD	Quality Control		
43	LOWER LAKE	Lower Lake	Surface Water		
43	PPC-3A	PPC-3A	Surface Water		
43	PPC-5	PPC-5	Surface Water		
44	PPC-7	PPC-7	Surface Water		
44	PPC-8	PPC-8	Surface Water		
44	PPC-103	PPC-103	Surface Water		

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	APSD-1	APSD-2	APSD-3
SAMPLE DATE	05/30/2003	05/30/2003	05/30/2003
SAMPLE TIME	15:25	15:40	16:00
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030242013	L030242014	L030242015
SAMPLE NUMBER	AEH-0306-112	AEH-0306-113	AEH-0306-114

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	2.56	6.3	6.48
OXYGEN (O) (FLD) DIS	0.28	0.09	0.2
PH (FLD)	6.83	6.51	6.67
PH	7.4	7.4	7.6
SALINITY (G/KG) (FLD) (ppt)	0.2	3.1	0.2
SC (UMHOS/CM AT 25 C)	744.0	5210.0	835.0
SC (UMHOS/CM AT 25 C) (FLD)	621.0	6140.0	675.0
TDS (MEASURED AT 180 C)	478.0	4622.0	560.0
TOTAL SUSPENDED SOLIDS	27.0	297.0	15.0
TURBIDITY (NTU) (FLD) (NTU)	8.0	45.0	1.0
WATER TEMPERATURE (C) (FLD)	7.3	8.3	8.4

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	76.0	545.0	97.0
MAGNESIUM (MG) DIS	15.0	195.0	18.0
SODIUM (NA) DIS	61.0	353.0	47.0
POTASSIUM (K) DIS	7.0	37.0	8.5
TOTAL ALKALINITY AS CACO ₃	276.0	842.0	158.0
BICARBONATE (HCO ₃)	337.0	1027.0	193.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	84.0	1729.0	225.0
CHLORIDE (CL)	9.6	503.0	27.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.8	57.0	4.7
ARSENIC +3	0.61	9.6	3.5
ARSENIC +5	0.14	58.0	1.4
CADMIUM (CD) DIS	<0.001	0.002	1.1
COPPER (CU) DIS	<0.004	0.007	0.014
IRON (FE) DIS	9.1	194.0	5.2
LEAD (PB) DIS	<0.005	0.005	<0.005
MANGANESE (MN) DIS	3.3	17.0	1.9
ZINC (ZN) DIS	<0.02	0.028	5.3

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; U1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	APSD-4	APSD-7	APSD-8
SAMPLE DATE	05/30/2003	05/30/2003	05/30/2003
SAMPLE TIME	15:12	14:30	14:35
LAB	ASARCO	TSC-SLC	ASARCO
LAB NUMBER	0306-222	L030242011	0306-218
REMARKS	SWL ONLY		SWL ONLY
SAMPLE NUMBER	AEH-0306-222	AEH-0306-110	AEH-0306-218

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	9.25	6.31	5.78
OXYGEN (O) (FLD) DIS		0.1	
PH (FLD)		7.19	
PH		7.7	
SALINITY (G/KG) (FLD) (ppt)		1.2	
SC (UMHOES/CM AT 25 C)		2570.0	
SC (UMHOES/CM AT 25 C) (FLD)		2530.0	
TDS (MEASURED AT 180 C)		1769.0	
TOTAL SUSPENDED SOLIDS		13.0	
TURBIDITY (NTU) (FLD) (NTU)		5.0	
WATER TEMPERATURE (C) (FLD)		10.8	

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	74.0
MAGNESIUM (MG) DIS	7.9
SODIUM (NA) DIS	468.0
POTASSIUM (K) DIS	28.0
TOTAL ALKALINITY AS CACO ₃	81.0
BICARBONATE (HCO ₃)	99.0
CARBONATE AS CO ₃	<2.0
SULFATE (SO ₄)	1084.0
CHLORIDE (CL)	103.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	3.7
ARSENIC +3	3.9
ARSENIC +5	0.1
CADMIUM (CD) DIS	0.014
COPPER (CU) DIS	0.007
IRON (FE) DIS	2.8
LEAD (PB) DIS	<0.005
MANGANESE (MN) DIS	0.72
ZINC (ZN) DIS	0.25

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	APSD-9	APSD-10	APSD-11
SAMPLE DATE	05/30/2003	05/30/2003	05/30/2003
SAMPLE TIME	14:40	15:10	14:45
LAB	ASARCO	TSC-SLC	ASARCO
LAB NUMBER	0306-219	L030242012	0306-220
REMARKS	SWL ONLY		SWL ONLY
SAMPLE NUMBER	AHH-0306-219	AHH-0306-111	AHH-0306-220

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	6.25	5.9	7.48
OXYGEN (O) (FLD) DIS		0.19	
PH (FLD)		7.12	
PH		7.3	
SALINITY (G/EG) (FLD) (ppt)		0.5	
SC (UMHOS/CM AT 25 C)		1176.0	
SC (UMHOS/CM AT 25 C) (FLD)		1170.0	
TDS (MEASURED AT 180 C)		896.0	
TOTAL SUSPENDED SOLIDS		15.0	
TURBIDITY (NTU) (FLD) (NTU)		9.0	
WATER TEMPERATURE (C) (FLD)		7.2	

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	201.0
MAGNESIUM (MG) DIS	20.0
SODIUM (NA) DIS	40.0
POTASSIUM (K) DIS	8.5
TOTAL ALKALINITY AS CaCO_3	120.0
BICARBONATE (HCO_3)	146.0
CARBONATE AS CO_3	<2.0
SULFATE (SO_4)	479.0
CHLORIDE (CL)	4.9

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.73
ARSENIC +3	0.58
ARSENIC +5	0.15
CADMIUM (CD) DIS	<0.001
COPPER (CU) DIS	<0.004
IRON (FE) DIS	6.0
LEAD (PB) DIS	<0.005
MANGANESE (MN) DIS	4.7
ZINC (ZN) DIS	0.35

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; U1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	APSD-12	APSD-13	DH-66
SAMPLE DATE	05/30/2003	05/30/2003	05/31/2003
SAMPLE TIME	14:50	16:30	14:30
LAB	ASARCO	TSC-SLC	TSC-SLC
LAB NUMBER	0306-221	L030242016	L030243017
REMARKS	SWL ONLY		
SAMPLE NUMBER	AEE-0306-221	AEE-0306-115	AEE-0306-136

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	4.9	14.86	40.5
OXYGEN (O) (FLD) DIS		0.0	4.4
PH (FLD)		6.1	6.16
PH		7.0	7.3
SALINITY (G/KG) (FLD) (ppt)		0.4	1.5
SC (UMHOS/CM AT 25 C)		988.0	3320.0
SC (UMHOS/CM AT 25 C) (FLD)		1010.0	3220.0
TDS (MEASURED AT 180 C)		646.0	2711.0
TOTAL SUSPENDED SOLIDS		1.4	91.0
TURBIDITY (NTU) (FLD) (NTU)		1.0	40.0
WATER TEMPERATURE (C) (FLD)		8.5	13.5

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	65.0	362.0
MAGNESIUM (MG) DIS	19.0	129.0
SODIUM (NA) DIS	80.0	189.0
POTASSIUM (K) DIS	11.0	14.0
TOTAL ALKALINITY AS CACO ₃	63.0	184.0
BICARBONATE (HCO ₃)	77.0	224.0
CARBONATE AS CO ₃	<2.0	<2.0
SULFATE (SO ₄)	312.0	1234.0
CHLORIDE (CL)	56.0	355.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	5.4	0.011
ARSENIC +3	5.5	<0.005
ARSENIC +5	<0.005	0.011
CADMIUM (CD) DIS	4.8	0.28
COPPER (CU) DIS	0.066	0.014
IRON (FB) DIS	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005
MANGANESE (MN) DIS	4.6	0.059
ZINC (ZN) DIS	8.6	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-1	DH-2	DH-3
SAMPLE DATE	05/30/2003	06/04/2003	05/30/2003
SAMPLE TIME	14:10	16:30	13:30
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030242010	L030256018	L030242009
SAMPLE NUMBER	AEH-0306-109	AEH-0306-216	AEH-0306-108

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	39.51	59.65	27.63
OXYGEN (O) (FLD) DIS	6.63	5.49	1.84
PH (FLD)	6.94	6.62	6.72
PH	7.7	7.7	7.7
SALINITY (G/KG) (FLD) (ppt)	0.8	0.1	0.1
SC (UMHOS/CM AT 25 C)	1864.0	598.0	516.0
SC (UMHOS/CM AT 25 C) (FLD)	1840.0	475.0	428.0
TDS (MEASURED AT 180 C)	1433.0	392.0	341.0
TOTAL SUSPENDED SOLIDS	<1.0	6.0	<1.0
TURBIDITY (NTU) (FLD) (NTU)	1.0	1.0	1.0
WATER TEMPERATURE (C) (FLD)	11.9	12.2	9.5

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	249.0	71.0	61.0
MAGNESIUM (MG) DIS	59.0	17.0	14.0
SODIUM (NA) DIS	146.0	28.0	24.0
POTASSIUM (K) DIS	13.0	7.0	5.3
TOTAL ALKALINITY AS CACO ₃	236.0	250.0	167.0
BICARBONATE (HCO ₃)	288.0	305.0	204.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	618.0	36.0	70.0
CHLORIDE (CL)	72.0	70.0	14.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	<0.005	0.008	0.009
ARSENIC +3	<0.005	<0.005	0.009
ARSENIC +5	<0.005	<0.005	<0.005
CADMIUM (CD) DIS	<0.001	<0.001	<0.001
COPPER (CU) DIS	<0.004	<0.004	<0.004
IRON (FE) DIS	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	<0.015	<0.015
ZINC (ZN) DIS	<0.02	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-4	DH-5	DH-5	DH-6
SAMPLE DATE	05/31/2003	05/31/2003	05/31/2003	06/03/2003
SAMPLE TIME	09:15	09:30	09:45	10:35
LAB	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030243003	L030243004	L030243005	L030247002
REMARKS			DUPLICATE	
SAMPLE NUMBER	AEE-0306-122	AEE-0306-123	AEE-0306-124	AEE-0306-185

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	9.16	12.89	14.0
OXYGEN (O) (FLD) DIS	0.41	6.06	3.64
pH (FLD)	6.4	6.44	6.52
pH	7.1	7.4	7.0
SALINITY (G/KG) (FLD) (ppt)	0.1	0.1	1.2
SC (UMHOS/CM AT 25 C)	2200.0	452.0	2410.0
SC (UMHOS/CM AT 25 C) (FLD)	2250.0	373.0	2550.0
TDS (MEASURED AT 180 C)	1531.0	294.0	1802.0
TOTAL SUSPENDED SOLIDS	72.0	2.9	4.2
TURBIDITY (NTU) (FLD) (NTU)	4.0	1.0	1.0
WATER TEMPERATURE (C) (FLD)	9.5	8.4	9.3

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	106.0	23.0	22.0	142.0
MAGNESIUM (MG) DIS	15.0	<5.0	<5.0	23.0
SODIUM (NA) DIS	353.0	58.0	57.0	249.0
POTASSIUM (K) DIS	13.0	<5.0	<5.0	163.0
TOTAL ALKALINITY AS CaCO_3	224.0	52.0	52.0	138.0
BICARBONATE (HCO_3)	273.0	63.0	63.0	168.0
CARBONATE AS CO_3	<2.0	<2.0	<2.0	<2.0
SULFATE (SO_4)	767.0	138.0	137.0	1022.0
CHLORIDE (CL) DIS	97.0	11.0	12.0	84.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	2.5	0.41	0.42	1.2
ARSENIC +3	0.74	0.32	0.32	1.3
ARSENIC +5	1.9	0.09	0.11	<0.005
CADMIUM (CD) DIS	<0.001	0.002	0.002	<0.001
COPPER (CU) DIS	<0.004	0.023	0.023	0.01
IRON (FE) DIS	25.0	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	0.023	0.022	<0.005
MANGANESE (MN) DIS	7.4	0.038	0.037	<0.015
ZINC (ZN) DIS	<0.02	1.1	1.1	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-7	DH-8	DH-9
SAMPLE DATE	05/31/2003	05/31/2003	06/01/2003
SAMPLE TIME	08:00	14:00	13:00
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030243001	L030243016	L030244014
SAMPLE NUMBER	AHH-0306-120	AHH-0306-135	AHH-0306-154

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	19.85	41.6	1050.0
OXYGEN (O) (FLD) DIS	4.85	5.28	4.4
PH (FLD)	5.65	6.5	7.1
PH	7.4	7.6	7.1
SALINITY (G/KG) (FLD) (ppt)	0.1	2.1	0.1
SC (UMHOS/CM AT 25 C)	448.0	4350.0	2320.0
SC (UMHOS/CM AT 25 C) (FLD)	375.0	4210.0	2250.0
TDS (MEASURED AT 180 C)	303.0	4016.0	1803.0
TOTAL SUSPENDED SOLIDS	3.6	2.8	565.0
TURBIDITY (NTU) (FLD) (NTU)	1.0	1.0	327.0
WATER TEMPERATURE (C) (FLD)	8.0	12.1	8.7

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	52.0	686.0	221.0
MAGNESIUM (MG) DIS	10.0	166.0	36.0
SODIUM (NA) DIS	21.0	97.0	205.0
POTASSIUM (K) DIS	5.0	19.0	94.0
TOTAL ALKALINITY AS CACO ₃	90.0	286.0	133.0
BICARBONATE (HCO ₃)	110.0	349.0	162.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	127.0	1768.0	1017.0
CHLORIDE (CL)	4.1	522.0	91.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	<0.005	0.024	0.74
ARSENIC +3	<0.005	0.005	0.62
ARSENIC +5	<0.005	0.014	0.12 J
CADMIUM (CD) DIS	<0.001	0.27	0.025
COPPER (CU) DIS	<0.004	0.01	0.025
IRON (FE) DIS	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	0.02
MANGANESE (MN) DIS	<0.015	0.016	<0.015
ZINC (ZN) DIS	<0.02	0.59	1.3

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-10A	DH-11	DH-12
SAMPLE DATE	06/03/2003	05/31/2003	06/01/2003
SAMPLE TIME	08:35	08:40	16:00
LAB	TSC-SLC	TSC-SLC	ASARCO
LAB NUMBER	L030245018	L030243002	0306-158
REMARKS			NO SAMPLE
OTHER INFO			Dry
SAMPLE NUMBER	AHH-0306-181	AHH-0306-121	AHH-0306-158

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	5.0	13.11
OXYGEN (O) (FLD) DIS	0.49	0.38
PH (FLD)	6.45	6.13
PH	7.4	7.4
SALINITY (G/KG) (FLD) (ppt)	1.0	0.4
SC (UMHOS/CM AT 25 C)	2150.0	1218.0
SC (UMHOS/CM AT 25 C) (FLD)	2300.0	994.0
TDS (MEASURED AT 180 C)	1605.0	901.0
TOTAL SUSPENDED SOLIDS	2.8	3.5
TURBIDITY (NTU) (FLD) (NTU)	1.0	1.0
WATER TEMPERATURE (C) (FLD)	6.5	8.9

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	150.0	138.0
MAGNESIUM (MG) DIS	25.0	32.0
SODIUM (NA) DIS	215.0	81.0
POTASSIUM (K) DIS	138.0	5.0
TOTAL ALKALINITY AS CACO ₃	142.0	120.0
BICARBONATE (HCO ₃)	173.0	146.0
CARBONATE AS CO ₃	<2.0	<2.0
SULFATE (SO ₄)	881.0	404.0
CHLORIDE (CL)	73.0	50.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.32	<0.005
ARSENIC +3	0.16	<0.005
ARSENIC +5	0.17	<0.005
CADMIUM (CD) DIS	<0.001	<0.001
COPPER (CU) DIS	0.007	<0.004
IRON (FE) DIS	0.044	<0.02
LEAD (PB) DIS	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	0.2
ZINC (ZN) DIS	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-13	DH-14	DH-15	DH-15
SAMPLE DATE	06/01/2003	05/31/2003	06/03/2003	06/03/2003
SAMPLE TIME	15:30		10:00	10:10
LAB	TSC-SLC	ASARCO	TSC-SLC	TSC-SLC
LAB NUMBER	L030244017	0306-223	L030245019	L030245020
REMARKS		SWL ONLY		DUPLICATE
SAMPLE NUMBER	AEH-0306-157	AEH-0306-223	AEH-0306-182	AEH-0306-183

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	30.2	8.02	14.02
OXYGEN (O) (FLD) DIS	0.32		0.45
PH (FLD)	5.96		6.49
PH	6.8		7.5
SALINITY (G/KG) (FLD) (ppt)	0.7		0.9
SC (UMHOS/CM AT 25 C)	1767.0		1965.0
SC (UMHOS/CM AT 25 C) (FLD)	1690.0		2030.0
TDS (MEASURED AT 180 C)	1183.0		1605.0
TOTAL SUSPENDED SOLIDS	31.0		4.2
TURBIDITY (NTU) (FLD) (NTU)	1.0		1.0
WATER TEMPERATURE (C) (FLD)	11.3		10.9

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	54.0	231.0	222.0
MAGNESIUM (MG) DIS	19.0	54.0	45.0
SODIUM (NA) DIS	262.0	139.0	141.0
POTASSIUM (K) DIS	21.0		8.5
TOTAL ALKALINITY AS CACO ₃	140.0	155.0	152.0
BICARBONATE (HCO ₃)	171.0	189.0	185.0
CARBONATE AS CO ₃	<2.0		<2.0
SULFATE (SO ₄)	610.0	850.0	861.0
CHLORIDE (CL)	104.0	67.0	66.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	32.0	<0.005	<0.005
ARSENIC +3	29.0	<0.005	<0.005
ARSENIC +5	3.0	<0.005	<0.005
CADMIUM (CD) DIS	0.001	<0.001	<0.001
COPPER (CU) DIS	<0.004	0.009	0.01
IRON (FE) DIS	9.2	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	4.3	<0.015	<0.015
ZINC (ZN) DIS	2.4	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
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 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-16	DH-17	DH-18
SAMPLE DATE	06/02/2003	06/02/2003	06/01/2003
SAMPLE TIME		08:45	14:45
LAB	ASARCO	TSC-SLC	TSC-SLC
LAB NUMBER	0306-161	L030244020	L030244016
REMARKS	NO SAMPLE		
OTHER INFO	Dry		
SAMPLE NUMBER	AER-0306-161	AER-0306-162	AER-0306-156

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	30.35	29.9
OXYGEN (O) (FLD) DIS	0.29	0.26
PH (FLD)	6.19	6.47
PH	7.5	7.5
SALINITY (G/KG) (FLD) (ppt)	1.5	0.1
SC (UMHOS/CM AT 25 C)	3170.0	357.0
SC (UMHOS/CM AT 25 C) (FLD)	3090.0	282.0
TDS (MEASURED AT 180 C)	2169.0	257.0
TOTAL SUSPENDED SOLIDS	38.0	13.0
TURBIDITY (NTU) (FLD) (NTU)	21.0	1.0
WATER TEMPERATURE (C) (FLD)	12.2	12.3

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	59.0	36.0
MAGNESIUM (MG) DIS	22.0	8.9
SODIUM (NA) DIS	585.0	18.0
POTASSIUM (K) DIS	19.0	6.2
TOTAL ALKALINITY AS CACO ₃	250.0	140.0
BICARBONATE (HCO ₃)	305.0	171.0
CARBONATE AS CO ₃	<2.0	<2.0
SULFATE (SO ₄)	1188.0	22.0
CHLORIDE (CL)	167.0	4.2

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	42.0	0.006
ARSENIC +3	36.0	0.008
ARSENIC +5	4.0	<0.005 UJ
CADMIUM (CD) DIS	0.001	0.004
COPPER (CU) DIS	<0.004	0.03
IRON (FE) DIS	4.0	<0.02
LEAD (PB) DIS	<0.005	0.047
MANGANESE (MN) DIS	4.3	<0.015
ZINC (ZN) DIS	0.94	0.023

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-19R	DH-20	DH-21
SAMPLE DATE	06/01/2003	05/31/2003	06/01/2003
SAMPLE TIME	08:00	11:05	11:00
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030244001	L030243007	L030244008
SAMPLE NUMBER	AEE-0306-140	AEE-0306-126	AEE-0306-148

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	15.36	14.46	24.2
OXYGEN (O) (FLD) DIS	0.01	0.48	1.63
PH (FLD)	3.93	6.58	8.06
PH	3.8	7.5	8.6
SALINITY (G/KG) (FLD) (ppt)	0.2	0.1	3.6
SC (UMHOOS/CM AT 25 C)	693.0	406.0	5980.0
SC (UMHOOS/CM AT 25 C) (FLD)	507.0	343.0	6840.0
TDS (MEASURED AT 180 C)	521.0	254.0	4306.0
TOTAL SUSPENDED SOLIDS	12.0	11.0	13.0
TURBIDITY (NTU) (FLD) (NTU)	2.0	1.0	1.0
WATER TEMPERATURE (C) (FLD)	12.3	8.2	13.1

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	40.0	52.0	<5.0
MAGNESIUM (MG) DIS	7.1	11.0	5.7
SODIUM (NA) DIS	32.0	15.0	1466.0
POTASSIUM (K) DIS	5.8	<5.0	15.0
TOTAL ALKALINITY AS CACO3	<2.0	206.0	1008.0
BICARBONATE (HCO3)	<2.0	251.0	1118.0
CARBONATE AS CO3	<2.0	<2.0	55.0
SULFATE (SO4)	249.0	8.2	1756.0
CHLORIDE (CL)	19.0	5.0	179.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	16.0	0.16	85.0
ARSENIC +3	13.0	0.095	72.0
ARSENIC +5	3.0	0.065	10.0
CADMIUM (CD) DIS	0.06	<0.001	0.003
COPPER (CU) DIS	0.016	<0.004	0.007
IRON (FE) DIS	7.5	5.4	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	0.98	3.1	0.024
ZINC (ZN) DIS	2.2	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
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 Validation Flags: A:Anomalous; W1:Blank; J2,WJ2: Standard; J3:Hold Time; J4,WJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-22	DH-23	DH-23	DH-24
SAMPLE DATE	05/31/2003	06/01/2003	06/01/2003	06/02/2003
SAMPLE TIME	12:20	12:20	12:30	13:15
LAB	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030243012	L030244011	L030244012	L030245010
REMARKS			DUPLICATE	
SAMPLE NUMBER	AHH-0306-131	AHH-0306-151	AHH-0306-152	AHH-0306-172

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FSET)	27.4	11.8	28.54
OXYGEN (O) (FLD) DIS	0.18	2.25	0.62
PH (FLD)	5.84	7.22	5.55
PH	7.0	7.3	6.6
SALINITY (G/KG) (FLD) (ppt)	0.3	0.6	0.7
SC (UMHOS/CM AT 25 C)	906.0	1473.0	1595.0
SC (UMHOS/CM AT 25 C) (FLD)	736.0	1460.0	1560.0
TDS (MEASURED AT 180 C)	602.0	1013.0	1116.0
TOTAL SUSPENDED SOLIDS	<1.0	6.4	5.2
TURBIDITY (NTU) (FLD) (NTU)	1.0	1.0	1.0
WATER TEMPERATURE (C) (FLD)	11.0	9.2	11.5

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	81.0	108.0	112.0	65.0
MAGNESIUM (MG) DIS	23.0	24.0	25.0	29.0
SODIUM (NA) DIS	56.0	129.0	131.0	195.0
POTASSIUM (K) DIS	8.5	31.0	33.0	15.0
TOTAL ALKALINITY AS CACO ₃	100.0	138.0	135.0	61.0
BICARBONATE (HCO ₃)	122.0	168.0	165.0	74.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0	<2.0
SULFATE (SO ₄)	235.0	488.0	481.0	587.0
CHLORIDE (CL)	66.0	80.0	85.0	101.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	6.7	0.88	0.89	9.2	
ARSENIC +3	6.2	0.77	0.66	6.0	
ARSENIC +5	0.6	0.12	J	0.21	J
CADMIUM (CD) DIS	2.9	0.43	0.44	0.15	
COPPER (CU) DIS	0.024	0.038	0.038	0.027	J
IRON (FE) DIS	<0.02	0.021	0.02	3.4	
LEAD (PB) DIS	<0.005	0.047	0.047	0.005	
MANGANESE (MN) DIS	4.6	1.1	1.1	9.4	
ZINC (ZN) DIS	1.6	3.1	3.0	6.9	

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-24	DH-27	DH-28
SAMPLE DATE	06/02/2003	06/01/2003	06/01/2003
SAMPLE TIME	13:25	09:20	
LAB	TSC-SLC	TSC-SLC	ASARCO
LAB NUMBER	L030245011	L030244003	0306-225
REMARKS	DUPLICATE		SWL ONLY
OTHER INFO			Dry
SAMPLE NUMBER	AEH-0306-173	AEH-0306-142	AEH-0306-225

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)		15.92
OXYGEN (O) (FLD) DIS		0.39
PH (FLD)		6.11
PH	6.6	7.0
SALINITY (G/KG) (FLD) (ppt)		0.8
SC (UMHOS/CM AT 25 C)	1615.0	1845.0
SC (UMHOS/CM AT 25 C) (FLD)		1860.0
TDS (MEASURED AT 180 C)	1175.0	1249.0
TOTAL SUSPENDED SOLIDS	14.0	13.0
TURBIDITY (NTU) (FLD) (NTU)		1.0
WATER TEMPERATURE (C) (FLD)		8.9

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	65.0	59.0
MAGNESIUM (MG) DIS	29.0	13.0
SODIUM (NA) DIS	194.0	265.0
POTASSIUM (K) DIS	17.0	30.0
TOTAL ALKALINITY AS CACO ₃	59.0	193.0
BICARBONATE (HCO ₃)	72.0	235.0
CARBONATE AS CO ₃	<2.0	<2.0
SULFATE (SO ₄)	598.0	580.0
CHLORIDE (CL)	93.0	94.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	9.6	9.7
ARSENIC +3	6.9	6.8
ARSENIC +5	2.9	2.9
CADMIUM (CD) DIS	0.16	0.001
COPPER (CU) DIS	0.015	<0.004
IRON (FE) DIS	3.4	2.8
LEAD (PB) DIS	0.005	<0.005
MANGANESE (MN) DIS	9.3	3.3
ZINC (ZN) DIS	6.9	0.047

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-29	DH-30	DH-31
SAMPLE DATE	05/31/2003	06/01/2003	06/01/2003
SAMPLE TIME	10:45	08:45	12:00
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030243006	L030244002	L030244010
SAMPLE NUMBER	AEH-0306-125	AEH-0306-141	AEH-0306-150

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	5.75	18.37	24.28
OXYGEN (O) (FLD) DIS	8.05	0.29	0.11
PH (FLD)	6.42	6.06	7.21
PH	7.0	7.4	7.8
SALINITY (G/KG) (FLD) (ppt)	0.6	2.4	1.3
SC (UMHOS/CM AT 25 C)	1485.0	4640.0	2720.0
SC (UMHOS/CM AT 25 C) (FLD)	1350.0	4760.0	2740.0
TDS (MEASURED AT 180 C)	962.0	3383.0	1924.0
TOTAL SUSPENDED SOLIDS	433.0	12.0	64.0
TURBIDITY (NTU) (FLD) (NTU)	152.0	6.0	20.0
WATER TEMPERATURE (C) (FLD)	9.5	9.5	9.8

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	85.0	82.0	93.0
MAGNESIUM (MG) DIS	21.0	16.0	19.0
SODIUM (NA) DIS	142.0	856.0	406.0
POTASSIUM (K) DIS	17.0	135.0	113.0
TOTAL ALKALINITY AS CACO ₃	207.0	274.0	300.0
BICARBONATE (HCO ₃)	253.0	334.0	366.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	485.0	1873.0	917.0
CHLORIDE (CL)	57.0	213.0	107.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	14.0	12.0	28.0
ARSENIC +3	10.0	9.4	25.0
ARSENIC +5	4.0	2.6	2.0
CADMIUM (CD) DIS	0.002	1.7	<0.001
COPPER (CU) DIS	<0.004	0.01	0.005
IRON (FE) DIS	20.0	0.97	15.0
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	8.1	5.6	7.4
ZINC (ZN) DIS	7.5	1.1	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-32	DH-33	DH-34
SAMPLE DATE	06/01/2003	06/01/2003	06/01/2003
SAMPLE TIME		10:15	10:30
LAB	ASARCO	TSC-SLC	TSC-SLC
LAB NUMBER	0306-145	L030244006	L030244007
REMARKS	NO SAMPLE		
OTHER INFO	Dry		
SAMPLE NUMBER	AEE-0306-145	AEE-0306-146	AEE-0306-147

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	31.1	26.98
OXYGEN (O) (FLD) DIS	0.21	0.23
PH (FLD)	7.97	8.36
PH	9.1	8.3
SALINITY (G/KG) (FLD) (ppt)	2.2	0.2
SC (UMHOS/CM AT 25 C)	4360.0	4090.0
SC (UMHOS/CM AT 25 C) (FLD)	4360.0	4080.0
TDS (MEASURED AT 180 C)	2990.0	2579.0
TOTAL SUSPENDED SOLIDS	11.0	4.5
TURBIDITY (NTU) (FLD) (NTU)	6.0	1.0
WATER TEMPERATURE (C) (FLD)	12.8	12.6

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	<5.0	9.4
MAGNESIUM (MG) DIS	<5.0	<5.0
SODIUM (NA) DIS	938.0	842.0
POTASSIUM (K) DIS	8.8	29.0
TOTAL ALKALINITY AS CACO ₃	528.0	496.0
BICARBONATE (HCOC ₃)	400.0	605.0
CARBONATE AS CO ₃	120.0	<2.0
SULFATE (SO ₄)	1459.0	1585.0
CHLORIDE (CL)	178.0	171.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	71.0	68.0
ARSENIC +3	69.0	64.0
ARSENIC +5	4.0	5.0
CADMIUM (CD) DIS	0.002	0.001
COPPER (CU) DIS	0.004	<0.004
IRON (FE) DIS	0.041	<0.02
LEAD (PB) DIS	<0.005	<0.005
MANGANESE (MN) DIS	0.086	0.034
ZINC (ZN) DIS	0.029	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; U1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-35	DH-36	DH-37
SAMPLE DATE	06/01/2003	06/01/2003	06/01/2003
SAMPLE TIME	11:30	08:00	10:00
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030244009	L030244019	L030244005
SAMPLE NUMBER	AEH-0306-149	AEH-0306-160	AEH-0306-144

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEST)	7.35	28.44	27.81
OXYGEN (O) (FLD) DIS	0.15	0.25	0.28
PH (FLD)	7.52	5.98	7.57
PH	7.3	7.3	7.5
SALINITY (G/KG) (FLD) (ppt)	1.1	0.1	1.7
SC (UMHOS/CM AT 25 C)	2300.0	2180.0	3350.0
SC (UMHOS/CM AT 25 C) (FLD)	2330.0	2130.0	3460.0
TDS (MEASURED AT 180 C)	1562.0	1500.0	2290.0
TOTAL SUSPENDED SOLIDS	10.0	8.1	36.0
TURBIDITY (NTU) (FLD) (NTU)	1.0	9.0	1.0
WATER TEMPERATURE (C) (FLD)	11.5	12.7	9.6

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	84.0	95.0	26.0
MAGNESIUM (MG) DIS	14.0	19.0	11.0
SODIUM (NA) DIS	288.0	310.0	642.0
POTASSIUM (K) DIS	128.0	72.0	14.0
TOTAL ALKALINITY AS CACO ₃	236.0	246.0	592.0
BICARBONATE (HC ₀₃)	288.0	300.0	722.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	712.0	701.0	919.0
CHLORIDE (CL)	140.0	131.0	145.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	5.9	11.0	43.0
ARSENIC +3	5.5	12.0	33.0
ARSENIC +5	<0.005 UJ	<0.005 UJ	11.0
CADMIUM (CD) DIS	0.006	0.78	<0.001
COPPER (CU) DIS	0.016	<0.004	<0.004
IRON (FE) DIS	1.9	0.091	9.0
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	5.1	7.4	1.9
ZINC (ZN) DIS	<0.02	<0.02	0.05

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-38	DH-39	DH-40
SAMPLE DATE	06/01/2003	05/31/2003	05/31/2003
SAMPLE TIME	09:35	12:00	11:45
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030244004	L030243011	L030243010
SAMPLE NUMBER	AEH-0306-143	AEH-0306-130	AEH-0306-129

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	21.6	27.78	22.86
OXYGEN (O) (FLD) DIS	0.24	1.25	0.13
PH (FLD)	8.2	6.44	6.47
PH	9.4	8.0	7.4
SALINITY (G/KG) (FLD) (ppt)	4.2	0.4	0.6
SC (UMHOS/CM AT 25 C)	7310.0	1120.0	1465.0
SC (UMHOS/CM AT 25 C) (FLD)	8300.0	1110.0	1470.0
TDS (MEASURED AT 180 C)	5247.0	770.0	1037.0
TOTAL SUSPENDED SOLIDS	20.0	29.0	2.5
TURBIDITY (NTU) (FLD) (NTU)	1.0	6.0	1.0
WATER TEMPERATURE (C) (FLD)	8.5	11.2	10.4

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	22.0	140.0	160.0
MAGNESIUM (MG) DIS	20.0	42.0	60.0
SODIUM (NA) DIS	1610.0	50.0	63.0
POTASSIUM (K) DIS	67.0	5.4	8.3
TOTAL ALKALINITY AS CACO ₃	1584.0	226.0	190.0
BICARBONATE (HCO ₃)	1083.0	276.0	232.0
CARBONATE AS CO ₃	418.0	<2.0	<2.0
SULFATE (SO ₄)	2172.0	284.0	404.0
CHLORIDE (CL)	323.0	45.0	147.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	91.0	0.018	0.98
ARSENIC +3	72.0	0.01	0.56
ARSENIC +5	19.0	0.007	0.43
CADMIUM (CD) DIS	0.002	<0.001	0.032
COPPER (CU) DIS	<0.004	<0.004	<0.004
IRON (FE) DIS	0.36	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	0.33	0.12	6.0
ZINC (ZN) DIS	<0.02	<0.02	0.13

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-41	DH-42	DH-43
SAMPLE DATE	05/31/2003	05/31/2003	05/31/2003
SAMPLE TIME	15:00	15:15	13:00
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030243018	L030243019	L030243014
SAMPLE NUMBER	AEH-0306-137	AEH-0306-138	AEH-0306-133

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	19.45	25.83	33.19
OXYGEN (O) (PLD) DIS	0.26	0.24	0.02
pH (PLD)	4.17	5.53	5.34
pH	3.9	7.0	6.3
SALINITY (G/KG) (PLD) (ppt)	1.0	0.2	0.4
SC (UMHOS/CM AT 25 C)	2210.0	823.0	1152.0
SC (UMHOS/CM AT 25 C) (PLD)	2270.0	672.0	1110.0
TDS (MEASURED AT 180 C)	1718.0	576.0	896.0
TOTAL SUSPENDED SOLIDS	12.0	4.3	15.0
TURBIDITY (NTU) (PLD) (NTU)	4.0	1.0	8.0
WATER TEMPERATURE (C) (PLD)	9.3	10.7	11.6

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	155.0	65.0	88.0
MAGNESIUM (MG) DIS	46.0	16.0	31.0
SODIUM (NA) DIS	143.0	52.0	64.0
POTASSIUM (K) DIS	22.0	12.0	9.1
TOTAL ALKALINITY AS CACO ₃	<2.0	70.0	26.0
BICARBONATE (HCO ₃)	<2.0	85.0	32.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	956.0	259.0	455.0
CHLORIDE (CL)	80.0	42.0	46.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	6.0	3.7	7.1
ARSENIC +3	1.4	3.3	5.8
ARSENIC +5	4.7	0.2	1.2
CADMIUM (CD) DIS	15.0	2.1	8.5
COPPER (CU) DIS	1.0	0.01	0.03
IRON (FE) DIS	5.5	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	7.0	1.6	7.6
ZINC (ZN) DIS	42.0	4.1	10.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (PLD) or calculated (CALC)
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 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-44	DH-45	DH-46
SAMPLE DATE	05/31/2003	05/30/2003	05/30/2003
SAMPLE TIME	11:30	17:00	17:15
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030243009	L030242017	L030242018
SAMPLE NUMBER	AEEH-0306-128	AEEH-0306-116	AEEH-0306-117

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (PEST)	22.94	8.94	5.31
OXYGEN (O) (FLD) DIS	4.87	0.8	0.25
PH (FLD)	6.45	6.52	6.48
PH	7.3	7.4	7.2
SALINITY (G/KG) (FLD) (ppt)	1.1	0.2	0.1
SC (UMHOS/CM AT 25 C)	2340.0	721.0	589.0
SC (UMHOS/CM AT 25 C) (FLD)	2390.0	574.0	490.0
TDS (MEASURED AT 180 C)	1900.0	478.0	357.0
TOTAL SUSPENDED SOLIDS	20.0	5.1	39.0
TURBIDITY (NTU) (FLD) (NTU)	7.0	4.0	8.0
WATER TEMPERATURE (C) (FLD)	10.5	9.0	10.0

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	263.0	75.0	50.0
MAGNESIUM (MG) DIS	112.0	22.0	14.0
SODIUM (NA) DIS	85.0	31.0	38.0
POTASSIUM (K) DIS	11.0	8.8	6.8
TOTAL ALKALINITY AS CACO ₃	188.0	144.0	176.0
BICARBONATE (HC ₀₃)	229.0	176.0	215.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	955.0	126.0	88.0
CHLORIDE (CL)	177.0	53.0	16.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	1.6	0.41	4.7
ARSENIC +3	1.5	0.31	2.9
ARSENIC +5	0.2	0.13	1.9
CADMIUM (CD) DIS	0.77	0.6	0.13
COPPER (CU) DIS	0.007	<0.004	<0.004
IRON (FE) DIS	<0.02	0.46	6.7
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	0.43	0.43	3.0
ZINC (ZN) DIS	1.3	4.5	1.2

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
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 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-47	DH-49	DH-50
SAMPLE DATE	05/30/2003	06/02/2003	06/02/2003
SAMPLE TIME	17:30	13:40	09:30
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030242019	L030245012	L030245002
SAMPLE NUMBER	AEH-0306-118	AEH-0306-174	AEH-0306-164

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	6.4	33.94	32.48
OXYGEN (O) (FLD) DIS	0.32	1.65	2.57
PH (FLD)	7.1	6.12	6.45
PH	7.1	7.1	7.3
SALINITY (G/KG) (FLD) (ppt)	0.6	0.6	1.0
SC (UMHOS/CM AT 25 C)	1522.0	1454.0	2220.0
SC (UMHOS/CM AT 25 C) (FLD)	1510.0	1400.0	2150.0
TDS (MEASURED AT 180 C)	999.0	1089.0	1536.0
TOTAL SUSPENDED SOLIDS	56.0	40.0	5.7
TURBIDITY (NTU) (FLD) (NTU)	9.0	32.0	9.0
WATER TEMPERATURE (C) (FLD)	8.2	11.8	11.6

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	.64.0	117.0	76.0
MAGNESIUM (MG) DIS	7.8	37.0	21.0
SODIUM (NA) DIS	240.0	127.0	361.0
POTASSIUM (K) DIS	16.0	6.7	15.0
TOTAL ALKALINITY AS CACO ₃	140.0	183.0	154.0
BICARBONATE (HCOC ₃)	171.0	223.0	188.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	471.0	392.0	781.0
CHLORIDE (CL)	63.0	54.0	132.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	1.8	4.1	14.0
ARSENIC +3	1.6	4.7	15.0
ARSENIC +5	0.2	<0.005	<0.005
CADMIUM (CD) DIS	<0.001	<0.001	<0.001
COPPER (CU) DIS	<0.004	<0.004 UJ	0.007 J
IRON (FE) DIS	1.5	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	1.2	0.017	<0.015
ZINC (ZN) DIS	<0.02	<0.02	0.13

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-51	DH-52	DH-53
SAMPLE DATE	06/02/2003	06/03/2003	06/02/2003
SAMPLE TIME	09:15	08:20	08:00
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030245001	L030245017	L030245016
SAMPLE NUMBER	AEH-0306-163	AEH-0306-180	AEH-0306-179

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEST)	31.72	3.91	7.18
OXYGEN (O) (FLD) DIS	0.0	0.14	0.42
PH (FLD)	6.29	6.51	5.98
PH	7.0	7.4	7.6
SALINITY (G/KG) (FLD) (ppt)	0.9	0.9	0.9
SC (UMHOS/CM AT 25 C)	2160.0	1968.0	1991.0
SC (UMHOS/CM AT 25 C) (FLD)	2080.0	2100.0	2120.0
TDS (MEASURED AT 180 C)	1659.0	1408.0	1477.0
TOTAL SUSPENDED SOLIDS	55.0	12.0	15.0
TURBIDITY (NTU) (NTU)	7.0	1.0	6.0
WATER TEMPERATURE (C) (FLD)	11.5	8.9	8.1

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	191.0	93.0	143.0
MAGNESIUM (MG) DIS	43.0	17.0	23.0
SODIUM (NA) DIS	215.0	198.0	182.0
POTASSIUM (K) DIS	15.0	156.0	116.0
TOTAL ALKALINITY AS CACO ₃	144.0	138.0	154.0
BICARBONATE (HCO ₃)	176.0	168.0	188.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	880.0	700.0	802.0
CHLORIDE (CL)	123.0	61.0	80.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.78	1.5	0.45
ARSENIC +3	0.93	1.5	0.32
ARSENIC +5	<0.005	<0.005	0.12
CADMIUM (CD) DIS	<0.001	<0.001	<0.001
COPPER (CU) DIS	0.009	0.007	0.007
IRON (FE) DIS	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	1.6	1.6	4.9
ZINC (ZN) DIS	<0.02	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-54	DH-55	DH-56
SAMPLE DATE	06/03/2003	06/03/2003	06/02/2003
SAMPLE TIME	15:15		
LAB	TSC-SLC	ASARCO	ASARCO
LAB NUMBER	L030247011	0306-232	0306-233
REMARKS		SWL ONLY	SWL ONLY
SAMPLE NUMBER	AEH-0306-194	AEH-0306-232	AEH-0306-233

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEST)	22.41	78.71	77.47
OXYGEN (O) (FLD) DIS	4.01		
PH (FLD)	6.47		
PH	7.1		
SALINITY (G/KG) (FLD) (ppt)	0.8		
SC (UMHOS/CM AT 25 C)	1775.0		
SC (UMHOS/CM AT 25 C) (FLD)	1840.0		
TDS (MEASURED AT 180 C)	1342.0		
TOTAL SUSPENDED SOLIDS	16.0		
TURBIDITY (NTU) (FLD) (NTU)	8.0		
WATER TEMPERATURE (C) (FLD)	11.1		

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	182.0
MAGNESIUM (MG) DIS	39.0
SODIUM (NA) DIS	156.0
POTASSIUM (K) DIS	11.0
TOTAL ALKALINITY AS CACO ₃	172.0
BICARBONATE (HCO ₃)	210.0
CARBONATE AS CO ₃	<2.0
SULFATE (SO ₄)	556.0
CHLORIDE (CL)	110.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (As) DIS	<0.005
ARSENIC +3	<0.005
ARSENIC +5	<0.005
CADMIUM (Cd) DIS	<0.001
COPPER (Cu) DIS	0.006
IRON (Fe) DIS	<0.02
LEAD (Pb) DIS	<0.005
MANGANESE (Mn) DIS	<0.015
ZINC (Zn) DIS	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; U1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-57	DH-58	DH-59
SAMPLE DATE	06/01/2003	06/01/2003	05/31/2003
SAMPLE TIME	12:45	13:30	15:45
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030244013	L030244015	L030243020
SAMPLE NUMBER	AHH-0306-153	AHH-0306-155	AHH-0306-139

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	27.11	15.8	15.36
OXYGEN (O) (PLD) DIS	0.23	1.03	0.01
PH (PLD)	7.03	6.72	3.93
PH	7.0	7.3	6.7
SALINITY (G/KG) (PLD) (ppt)	1.1	0.9	0.2
SC (UMHOS/CM AT 25 C)	2480.0	1994.0	705.0
SC (UMHOS/CM AT 25 C) (PLD)	2450.0	1940.0	507.0
TDS (MEASURED AT 180 C)	1806.0	1446.0	450.0
TOTAL SUSPENDED SOLIDS	13.0	28.0	15.0
TURBIDITY (NTU) (PLD) (NTU)	6.0	8.0	2.0
WATER TEMPERATURE (C) (PLD)	11.3	10.3	12.3

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	134.0	144.0	41.0
MAGNESIUM (MG) DIS	19.0	22.0	7.1
SODIUM (NA) DIS	360.0	242.0	59.0
POTASSIUM (K) DIS	45.0	33.0	22.0
TOTAL ALKALINITY AS CACO ₃	168.0	164.0	84.0
BICARBONATE (HCO ₃)	205.0	200.0	102.5
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	938.0	732.0	200.0
CHLORIDE (CL)	129.0	88.0	18.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	2.3	2.0	14.0
ARSENIC +3	2.2	2.2	15.0
ARSENIC +5	1.0	<0.005 UJ	<0.005
CADMIUM (CD) DIS	0.012	<0.001	0.33
COPPER (CU) DIS	0.009	0.009	0.047
IRON (FE) DIS	0.54	<0.02	1.2
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	3.3	1.1	2.1
ZINC (ZN) DIS	0.19	<0.02	2.2

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-60	DH-61	DH-62
SAMPLE DATE	05/31/2003	05/31/2003	05/31/2003
SAMPLE TIME	12:40	14:00	13:30
LAB	TSC-SLC	ASARCO	TSC-SLC
LAB NUMBER	L030243013	0306-224	L030243015
REMARKS		SWL ONLY	
OTHER INFO		Dry	
SAMPLE NUMBER	AEE-0306-132	AEE-0306-224	AEE-0306-134

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	27.87	42.58
OXYGEN (O) (FLD) DIS	4.86	3.38
PH (FLD)	6.37	6.43
PH	7.6	7.7
SALINITY (G/KG) (FLD) (ppt)	1.4	0.6
SC (UMHOS/CM AT 25 C)	3070.0	1550.0
SC (UMHOS/CM AT 25 C) (FLD)	2950.0	1510.0
TDS (MEASURED AT 180 C)	2649.0	1225.0
TOTAL SUSPENDED SOLIDS	518.0	1.8
TURBIDITY (NTU) (FLD) (NTU)	328.0	1.0
WATER TEMPERATURE (C) (FLD)	14.5	11.3

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	366.0	209.0
MAGNESIUM (MG) DIS	93.0	48.0
SODIUM (NA) DIS	153.0	41.0
POTASSIUM (K) DIS	22.0	11.0
TOTAL ALKALINITY AS CACO ₃	226.0	222.0
BICARBONATE (HCO ₃)	276.0	271.0
CARBONATE AS CO ₃	<2.0	<2.0
SULFATE (SO ₄)	1159.0	599.0
CHLORIDE (CL)	240.0	51.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.73	0.007
ARSENIC +3	0.67	0.006
ARSENIC +5	0.07	<0.005
CADMIUM (CD) DIS	0.004	0.002
COPPER (CU) DIS	0.008	<0.004
IRON (FE) DIS	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	0.063
ZINC (ZN) DIS	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-63	DH-64	DH-65
SAMPLE DATE	06/02/2003	06/02/2003	06/02/2003
SAMPLE TIME	15:00	12:15	
LAB	TSC-SLC	TSC-SLC	ASARCO
LAB NUMBER	L030245014	L030245008	0306-234
REMARKS			SWL ONLY
SAMPLE NUMBER	AEH-0306-176	AEH-0306-170	AEH-0306-234

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	36.31	32.69	59.29
OXYGEN (O) (FLD) DIS	5.72	0.27	
PH (FLD)	6.6	6.16	
PH	7.7	6.8	
SALINITY (G/KG) (FLD) (ppt)	0.7	1.2	
SC (UMHOS/CM AT 25 C)	1731.0	2640.0	
SC (UMHOS/CM AT 25 C) (FLD)	1670.0	2560.0	
TDS (MEASURED AT 180 C)	1231.0	1795.0	
TOTAL SUSPENDED SOLIDS	3.7	23.0	
TURBIDITY (NTU) (FLD) (NTU)	4.0	7.0	
WATER TEMPERATURE (C) (FLD)	12.1	12.6	

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	139.0	62.0	
MAGNESIUM (MG) DIS	47.0	24.0	
SODIUM (NA) DIS	146.0	439.0	
POTASSIUM (K) DIS	7.1	18.0	
TOTAL ALKALINITY AS CACO ₃	288.0	167.0	
BICARBONATE (HC0 ₃)	351.0	204.0	
CARBONATE AS CO ₃	<2.0	<2.0	
SULFATE (SO ₄)	403.0	824.0	
CHLORIDE (CL)	114.0	158.0	

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	<0.005	36.0	
ARSENIC +3	<0.005	35.0	
ARSENIC +5	<0.005	1.0	
CADMIUM (CD) DIS	<0.001	0.049	
COPPER (CU) DIS	0.007 J	0.004 J	
IRON (FE) DIS	<0.02	6.5	
LEAD (PB) DIS	<0.005	<0.005	
MANGANESE (MN) DIS	<0.015	6.4	
ZINC (ZN) DIS	<0.02	2.0	

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	DH-67	EE-103	EE-104
SAMPLE DATE	06/02/2003	06/03/2003	06/04/2003
SAMPLE TIME	14:40	15:00	11:35
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030245013	L030247010	L030256009
SAMPLE NUMBER	AEH-0306-175	AEH-0306-193	AEH-0306-207

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FERT)	31.79	24.12	34.35
OXYGEN (O) (FLD) DIS	1.36	0.32	8.16
PH (FLD)	6.19	6.44	6.61
PH	7.3	7.3	7.3
SALINITY (G/KG) (FLD) (ppt)	0.9	0.6	0.5
SC (UMHOS/CM AT 25 C)	1996.0	1410.0	1282.0
SC (UMHOS/CM AT 25 C) (FLD)	1920.0	1450.0	1260.0
TDS (MEASURED AT 180 C)	1485.0	1093.0	898.0
TOTAL SUSPENDED SOLIDS	11.0	2.8	30.0
TURBIDITY (NTU) (FLD) (NTU)	7.0	1.0	6.0
WATER TEMPERATURE (C) (FLD)	12.4	13.2	11.3

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	187.0	166.0	121.0
MAGNESIUM (MG) DIS	67.0	36.0	29.0
SODIUM (NA) DIS	131.0	75.0	109.0
POTASSIUM (K) DIS	8.6	7.4	5.1
TOTAL ALKALINITY AS CACO ₃	148.0	150.0	176.0
BICARBONATE (HCO ₃)	161.0	183.0	215.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	581.0	462.0	319.0
CHLORIDE (CL)	194.0	52.0	94.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.006	<0.005	<0.005
ARSENIC +3	<0.005	<0.005	<0.005
ARSENIC +5	<0.005	<0.005	<0.005
CADMIUM (CD) DIS	<0.001	<0.001	<0.001
COPPER (CU) DIS	0.009	0.004	0.005
IRON (FE) DIS	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	0.35	<0.015
ZINC (ZN) DIS	<0.02	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	EH-107	EH-109	EH-110
SAMPLE DATE	06/04/2003	06/04/2003	06/03/2003
SAMPLE TIME	14:45	15:40	17:00
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030256014	L030256017	L030247015
SAMPLE NUMBER	AEH-0306-212	AEH-0306-215	AEH-0306-198

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	21.79	24.72	19.85
OXYGEN (O) (FLD) DIS	0.48	0.35	0.44
PH (FLD)	6.28	6.17	6.48
PH	7.4	7.1	7.1
SALINITY (G/KG) (FLD) (ppt)	0.7	0.9	0.9
SC (UMHOS/CM AT 25 C)	1640.0	2130.0	1902.0
SC (UMHOS/CM AT 25 C) (FLD)	1620.0	2040.0	1990.0
TDS (MEASURED AT 180 C)	1292.0	1533.0	1462.0
TOTAL SUSPENDED SOLIDS	7.8	4.2	8.5
TURBIDITY (NTU) (FLD) (NTU)	2.0	1.0	1.0
WATER TEMPERATURE (C) (FLD)	12.7	12.1	12.3

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	189.0	105.0	195.0
MAGNESIUM (MG) DIS	42.0	30.0	44.0
SODIUM (NA) DIS	106.0	311.0	165.0
POTASSIUM (K) DIS	7.9	14.0	11.0
TOTAL ALKALINITY AS CACO ₃	156.0	122.0	156.0
BICARBONATE (HCO ₃)	190.0	149.0	190.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	612.0	787.0	682.0
CHLORIDE (CL)	102.0	119.0	104.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	<0.005	8.2	<0.005
ARSENIC +3	<0.005	7.5	<0.005
ARSENIC +5	<0.005	0.7	<0.005
CADMIUM (CD) DIS	<0.001	<0.001	<0.001
COPPER (CU) DIS	0.004	0.008	0.007
IRON (FE) DIS	0.069	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	0.35	15.0	2.3
ZINC (ZN) DIS	<0.02	0.86	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	EH-111	EH-112	EH-113
SAMPLE DATE	06/04/2003	06/04/2003	06/04/2003
SAMPLE TIME	12:00	12:30	09:50
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030256010	L030256011	L030256004
SAMPLE NUMBER	AEH-0306-208	AEH-0306-209	AEH-0306-202

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	29.69	26.98	26.81
OXYGEN (O) (FLD) DIS	0.41	2.88	9.9
PH (FLD)	6.11	6.12	6.17
PH	6.9	7.1	7.1
SALINITY (G/KG) (FLD) (ppt)	0.9	0.6	0.5
SC (UMHOS/CM AT 25 C)	1975.0	1544.0	1295.0
SC (UMHOS/CM AT 25 C) (FLD)	1940.0	1520.0	1270.0
TDS (MEASURED AT 180 C)	1421.0	1162.0	911.0
TOTAL SUSPENDED SOLIDS	11.0	32.0	291.0
TURBIDITY (NTU) (FLD) (NTU)	4.0	8.0	15.0
WATER TEMPERATURE (C) (FLD)	11.2	11.8	11.0

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	123.0	175.0	97.0
MAGNESIUM (MG) DIS	33.0	38.0	30.0
SODIUM (NA) DIS	254.0	111.0	131.0
POTASSIUM (K) DIS	11.0	6.5	5.1
TOTAL ALKALINITY AS CACO ₃	116.0	142.0	188.0
BICARBONATE (HCO ₃)	142.0	173.0	229.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	761.0	516.0	362.0
CHLORIDE (CL)	137.0	92.0	49.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.71	<0.005	<0.005
ARSENIC +3	0.86	<0.005	<0.005
ARSENIC +5	<0.005	<0.005	<0.005
CADMIUM (CD) DIS	<0.001	<0.001	<0.001
COPPER (CU) DIS	0.007	0.005	<0.004
IRON (FE) DIS	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	5.3	<0.015	<0.015
ZINC (ZN) DIS	<0.02	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
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 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	EH-114	EH-115	EH-50
SAMPLE DATE	06/03/2003	06/04/2003	06/03/2003
SAMPLE TIME	11:30	13:15	13:30
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030247004	L030256012	L030247007
SAMPLE NUMBER	AHH-0306-187	AHH-0306-210	AHH-0306-190

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	32.41	34.66	27.0
OXYGEN (O) (FLD) DIS	0.1	2.37	1.91
PH (FLD)	6.47	6.4	6.21
PH	7.1	7.3	7.0
SALINITY (G/KG) (FLD) (ppt)	0.7	0.6	0.7
SC (UMHOS/CM AT 25 C)	1570.0	1506.0	1514.0
SC (UMHOS/CM AT 25 C) (FLD)	1650.0	1480.0	1590.0
TDS (MEASURED AT 180 C)	1143.0	1088.0	1124.0
TOTAL SUSPENDED SOLIDS	15.0	29.0	30.0
TURBIDITY (NTU) (FLD) (NTU)	0.07	23.0	36.0
WATER TEMPERATURE (C) (FLD)	11.2	11.8	7.7

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	136.0	143.0	126.0
MAGNESIUM (MG) DIS	33.0	37.0	35.0
SODIUM (NA) DIS	149.0	134.0	136.0
POTASSIUM (K) DIS	7.1	7.3	6.6
TOTAL ALKALINITY AS CACO ₃	154.0	180.0	142.0
BICARBONATE (HC0 ₃)	188.0	220.0	173.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	490.0	514.0	492.0
CHLORIDE (CL)	116.0	97.0	103.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	<0.005	<0.005	0.28
ARSENIC +3	<0.005	<0.005	0.12
ARSENIC +5	<0.005	<0.005	0.17
CADMIUM (CD) DIS	<0.001	<0.001	<0.001
COPPER (CU) DIS	0.006	0.006	0.005
IRON (FE) DIS	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	<0.015	<0.015
ZINC (ZN) DIS	<0.02	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	EH-51	EH-51	BR-52	EH-53
SAMPLE DATE	06/04/2003	06/04/2003	06/03/2003	06/04/2003
SAMPLE TIME	09:15	09:30	16:30	10:05
LAB	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030256002	L030256003	L030247014	L030256005
REMARKS	DUPLICATE			
SAMPLE NUMBER	AHH-0306-200	AHH-0306-201	AHH-0306-197	AHH-0306-203

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	14.0		7.07	27.31
OXYGEN (O) (FLD) DIS	4.78		5.68	10.06
pH (FLD)	5.99		6.5	6.31
pH	7.3	7.2	7.1	7.3
SALINITY (G/KG) (FLD) (ppt)	0.2		0.2	0.5
SC (UMHOS/CM AT 25 C)	782.0	780.0	772.0	1332.0
SC (UMHOS/CM AT 25 C) (FLD)	631.0		659.0	1300.0
TDS (MEASURED AT 180 C)	516.0	510.0	519.0	969.0
TOTAL SUSPENDED SOLIDS	7.5	9.2	3.7	16.0
TURBIDITY (NTU) (FLD) (NTU)	1.0		3.0	1.0
WATER TEMPERATURE (C) (FLD)	10.3		9.1	11.1

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	40.0	41.0	59.0	138.0
MAGNESIUM (MG) DIS	8.0	8.0	10.0	42.0
SODIUM (NA) DIS	98.0	98.0	52.0	93.0
POTASSIUM (K) DIS	18.0	18.0	45.0	5.5
TOTAL ALKALINITY AS CACO ₃	129.0	127.0	104.0	194.0
BICARBONATE (HCO ₃)	157.0	155.0	127.0	237.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0	<2.0
SULFATE (SO ₄)	194.0	187.0	202.0	372.0
CHLORIDE (CL)	23.0	24.0	26.0	68.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.076	0.079	0.33	<0.005
ARSENIC +3	0.073	0.082	0.16	<0.005
ARSENIC +5	0.008	<0.005	0.18	<0.005
CADMIUM (CD) DIS	<0.001	<0.001	<0.001	<0.001
COPPER (CU) DIS	<0.004	<0.004	<0.004	<0.004
IRON (FE) DIS	<0.02	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	<0.015	<0.015	<0.015
ZINC (ZN) DIS	<0.02	<0.02	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	EH-54	EH-57A	EH-58
SAMPLE DATE	06/04/2003	06/03/2003	06/03/2003
SAMPLE TIME	11:15	11:10	15:45
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030256007	L030247003	L030247012
SAMPLE NUMBER	AEH-0306-205	AEH-0306-186	AEH-0306-195

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	7.56	37.92	15.34
OXYGEN (O) (FLD) DIS	6.77	9.91	4.12
PH (FLD)	6.42	6.84	6.51
PH	7.5	7.4	7.2
SALINITY (G/KG) (FLD) (ppt)	0.0	0.2	0.1
SC (UMHOS/CM AT 25 C)	221.0	593.0	545.0
SC (UMHOS/CM AT 25 C) (FLD)	180.0	512.0	472.0
TDS (MEASURED AT 180 C)	145.0	395.0	375.0
TOTAL SUSPENDED SOLIDS	19.0	45.0	6.2
TURBIDITY (NTU) (FLD) (NTU)	5.0	3.0	1.0
WATER TEMPERATURE (C) (FLD)	6.4	11.6	10.1

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	24.0	57.0	61.0
MAGNESIUM (MG) DIS	<5.0	20.0	15.0
SODIUM (NA) DIS	11.0	28.0	19.0
POTASSIUM (K) DIS	<5.0	<5.0	<5.0
TOTAL ALKALINITY AS CACO ₃	74.0	161.0	96.0
BICARBONATE (HC0 ₃)	90.0	196.0	117.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	26.0	98.0	122.0
CHLORIDE (CL)	1.8	28.0	24.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.015	<0.005	<0.005
ARSENIC +3	0.006	<0.005	<0.005
ARSENIC +5	0.009	<0.005	<0.005
CADMIUM (CD) DIS	<0.001	<0.001	<0.001
COPPER (CU) DIS	<0.004	<0.004	<0.004
IRON (FE) DIS	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	<0.015	<0.015
ZINC (ZN) DIS	<0.02	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	ERH-59	ERH-60	ERH-61
SAMPLE DATE	06/03/2003	06/03/2003	06/03/2003
SAMPLE TIME	16:15	14:30	14:10
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030247013	L030247009	L030247008
SAMPLE NUMBER	ERH-0306-196	ERH-0306-192	ERH-0306-191

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	7.64	31.65	23.68
OXYGEN (O) (FLD) DIS	8.02	0.15	0.31
PH (FLD)	6.5	6.23	6.48
PH	7.3	6.9	7.1
SALINITY (G/KG) (FLD) (ppt)	0.1	1.0	0.9
SC (UMHOS/CM AT 25 C)	450.0	2100.0	1971.0
SC (UMHOS/CM AT 25 C) (FLD)	391.0	2190.0	2060.0
TDS (MEASURED AT 180 C)	294.0	1494.0	1530.0
TOTAL SUSPENDED SOLIDS	4.5	1.9	23.0
TURBIDITY (NTU) (FLD) (NTU)	1.0	1.0	18.0
WATER TEMPERATURE (C) (FLD)	9.1	11.3	12.3

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	33.0	97.0	209.0
MAGNESIUM (MG) DIS	6.6	28.0	43.0
SODIUM (NA) DIS	34.0	302.0	176.0
POTASSIUM (K) DIS	20.0	13.0	13.0
TOTAL ALKALINITY AS CACO ₃	90.0	160.0	156.0
BICARBONATE (HCO ₃)	110.0	195.0	190.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	103.0	706.0	761.0
CHLORIDE (CL)	11.0	158.0	108.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.018	11.0	<0.005
ARSENIC +3	0.009	14.0	<0.005
ARSENIC +5	0.009	<0.005	<0.005
CADMIUM (CD) DIS	<0.001	0.001	<0.001
COPPER (CU) DIS	<0.004	0.011	0.007
IRON (PB) DIS	<0.02	0.069	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	18.0	0.6
ZINC (ZN) DIS	<0.02	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; U1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	EH-62	EH-63	EH-64
SAMPLE DATE	06/04/2003	06/03/2003	06/04/2003
SAMPLE TIME	10:50	11:45	15:20
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030256006	L030247005	L030256016
SAMPLE NUMBER	AER-0306-204	AER-0306-188	AER-0306-214

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	23.77	19.21	25.4
OXYGEN (O) (PLD) DIS	8.22	8.37	9.42
PH (PLD)	6.39	6.81	6.35
PH	7.4	7.3	7.4
SALINITY (G/KG) (PLD) (ppt)	0.1	0.1	0.3
SC (UMHOS/CM AT 25 C)	445.0	444.0	898.0
SC (UMHOS/CM AT 25 C) (PLD)	354.0	385.0	727.0
TDS (MEASURED AT 180 C)	291.0	298.0	611.0
TOTAL SUSPENDED SOLIDS	6.1	6.2	29.0
TURBIDITY (NTU) (PLD) (NTU)	1.0	6.0	11.0
WATER TEMPERATURE (C) (PLD)	10.4	10.8	10.8

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	36.0	38.0	74.0
MAGNESIUM (MG) DIS	8.6	7.9	17.0
SODIUM (NA) DIS	42.0	36.0	79.0
POTASSIUM (K) DIS	<5.0	<5.0	6.8
TOTAL ALKALINITY AS CACO ₃	124.0	100.0	144.0
BICARBONATE (HCOC ₃)	151.0	122.0	176.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	62.0	69.0	235.0
CHLORIDE (CL)	10.0	19.0	45.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	<0.005	<0.005	<0.005
ARSENIC +3	<0.005	<0.005	<0.005
ARSENIC +5	<0.005	<0.005	<0.005
CADMIUM (CD) DIS	<0.001	<0.001	<0.001
COPPER (CU) DIS	<0.004	<0.004	<0.004
IRON (FE) DIS	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	<0.015	<0.015
ZINC (ZN) DIS	<0.02	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (PLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	EH-65	EH-100	EH-101
SAMPLE DATE	06/04/2003	06/03/2003	06/04/2003
SAMPLE TIME	15:00	12:55	08:30
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030256015	L030247006	L030256001
SAMPLE NUMBER	AHH-0306-213	AHH-0306-189	AHH-0306-199

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	24.15	27.3	14.27
OXYGEN (O) (FLD) DIS	0.18	0.41	4.28
PH (FLD)	6.19	5.96	5.83
PH	7.0	6.7	7.6
SALINITY (G/KG) (FLD) (ppt)	0.7	1.0	0.2
SC (UMHOS/CM AT 25 C)	1701.0	2080.0	648.0
SC (UMHOS/CM AT 25 C) (FLD)	1680.0	2190.0	526.0
TDS (MEASURED AT 180 C)	1221.0	1617.0	426.0
TOTAL SUSPENDED SOLIDS	12.0	1.5	16.0
TURBIDITY (NTU) (FLD) (NTU)	3.0	1.0	1.0
WATER TEMPERATURE (C) (FLD)	11.0	12.3	10.7

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	101.0	157.0	35.0
MAGNESIUM (MG) DIS	27.0	54.0	7.2
SODIUM (NA) DIS	218.0	216.0	84.0
POTASSIUM (K) DIS	10.0	13.0	14.0
TOTAL ALKALINITY AS CACO ₃	148.0	114.0	116.0
BICARBONATE (HCO ₃)	181.0	139.0	142.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	568.0	799.0	153.0
CHLORIDE (CL)	127.0	149.0	18.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	<0.005	10.0	<0.005
ARSENIC +3	<0.005	9.7	<0.005
ARSENIC +5	<0.005	1.4	<0.005
CADMIUM (CD) DIS	<0.001	0.006	<0.001
COPPER (CU) DIS	0.008	0.013	<0.004
IRON (FE) DIS	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	4.8	20.0	<0.015
ZINC (ZN) DIS	<0.02	1.2	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; U1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	EH-102	EH-106	MW-1
SAMPLE DATE	06/03/2003	06/04/2003	05/30/2003
SAMPLE TIME		13:45	09:00
LAB	ASARCO	TSC-SLC	TSC-SLC
LAB NUMBER	0306-235	L030256013	L030242001
REMARKS	SWL ONLY		
SAMPLE NUMBER	AHH-0306-235	AHH-0306-211	AHH-0306-100

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FRET)	8.6	29.65	51.07
OXYGEN (O) (FLD) DIS		1.09	7.63
PH (FLD)		6.12	5.83
PH		6.9	7.8
SALINITY (G/KG) (FLD) (ppt)		0.7	0.1
SC (UMHOS/CM AT 25 C)		1643.0	431.0
SC (UMHOS/CM AT 25 C) (FLD)		1620.0	3600.0 R
TDS (MEASURED AT 180 C)		1206.0	313.0
TOTAL SUSPENDED SOLIDS		15.0	2.8
TURBIDITY (NTU) (FLD) (NTU)		6.0	1.0
WATER TEMPERATURE (C) (FLD)		11.7	10.6

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	108.0	46.0
MAGNESIUM (MG) DIS	26.0	9.8
SODIUM (NA) DIS	201.0	25.0
POTASSIUM (K) DIS	8.2	<5.0
TOTAL ALKALINITY AS CACO ₃	132.0	117.0
BICARBONATE (HC0 ₃)	161.0	143.0
CARBONATE AS CO ₃	<2.0	<2.0
SULFATE (SO ₄)	602.0	74.0
CHLORIDE (CL)	98.0	13.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	1.5	<0.005
ARSENIC +3	1.3	<0.005
ARSENIC +5	<0.005	<0.005
CADMIUM (CD) DIS	<0.001	<0.001
COPPER (CU) DIS	0.006	<0.004
IRON (FE) DIS	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005
MANGANESE (MN) DIS	0.9	<0.015
ZINC (ZN) DIS	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC).
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	MW-2	MW-3	MW-4
SAMPLE DATE	05/30/2003	05/30/2003	05/30/2003
SAMPLE TIME	09:45	10:10	10:35
LAB	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030242002	L030242003	L030242004
SAMPLE NUMBER	AEH-0306-101	AEH-0306-102	AEH-0306-103

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEST)	34.35	29.97	46.03
OXYGEN (O) (FLD) DIS	0.26	0.19	7.94
PH (FLD)	6.47	6.57	6.71
PH	7.7	7.6	7.6
SALINITY (G/KG) (FLD) (ppt)	0.1	0.2	0.1
SC (UMHOS/CM AT 25 C)	538.0	621.0	464.0
SC (UMHOS/CM AT 25 C) (FLD)	446.0	516.0	386.0
TDS (MEASURED AT 180 C)	347.0	411.0	325.0
TOTAL SUSPENDED SOLIDS	<1.0	1.5	135.0
TURBIDITY (NTU) (FLD) (NTU)	1.0	1.0	269.0
WATER TEMPERATURE (C) (FLD)	10.1	10.0	13.7

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	72.0	79.0	52.0
MAGNESIUM (MG) DIS	16.0	18.0	11.0
SODIUM (NA) DIS	21.0	22.0	27.0
POTASSIUM (K) DIS	5.7	5.3	6.0
TOTAL ALKALINITY AS CACO ₃	250.0	260.0	158.0
BICARBONATE (HC0 ₃)	305.0	317.0	193.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0
SULFATE (SO ₄)	26.0	56.0	64.0
CHLORIDE (CL)	6.0	10.0	8.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.012	0.012	<0.005
ARSENIC +3	0.01	0.006	<0.005
ARSENIC +5	<0.005	0.007	<0.005
CADMIUM (CD) DIS	<0.001	<0.001	<0.001
COPPER (CU) DIS	<0.004	<0.004	<0.004
IRON (FE) DIS	<0.02	<0.02	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	0.26	0.026	<0.015
ZINC (ZN) DIS	<0.02	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	MW-5	MW-6	MW-6	MW-7
SAMPLE DATE	05/30/2003	05/30/2003	05/30/2003	05/30/2003
SAMPLE TIME	11:15	12:30	12:45	12:00
LAB	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	L030242005	L030242007	L030242008	L030242006
REMARKS		DUPPLICATE		
SAMPLE NUMBER	AEH-0306-104	AEH-0306-106	AEH-0306-107	AEH-0306-105

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	52.39	25.99	55.65
OXYGEN (O) (FLD) DIS	8.0	0.16	7.97
PH (FLD)	7.12	6.82	7.04
PH	7.8	7.5	7.6
SALINITY (G/KG) (FLD) (ppt)	0.1	0.2	0.0
SC (UMHOS/CM AT 25 C)	345.0	700.0	236.0
SC (UMHOS/CM AT 25 C) (FLD)	289.0	574.0	200.0
TDS (MEASURED AT 180 C)	230.0	464.0	203.0
TOTAL SUSPENDED SOLIDS	34.0	5.0	273.0
TURBIDITY (NTU) (FLD) (NTU)	48.0	15.0	185.0
WATER TEMPERATURE (C) (FLD)	10.7	10.0	13.2

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	36.0	94.0	92.0	18.0
MAGNESIUM (MG) DIS	7.5	21.0	20.0	5.6
SODIUM (NA) DIS	25.0	25.0	25.0	18.0
POTASSIUM (K) DIS	<5.0	5.0	<5.0	<5.0
TOTAL ALKALINITY AS CACO ₃	136.0	288.0	294.0	85.0
BICARBONATE (HCO ₃)	166.0	351.0	359.0	104.0
CARBONATE AS CO ₃	<2.0	<2.0	<2.0	<2.0
SULFATE (SO ₄)	26.0	69.0	78.0	25.0
CHLORIDE (CL)	5.5	9.4	8.8	1.6

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.006	0.14	0.14	0.014
ARSENIC +3	<0.005	0.095	0.095	0.007
ARSENIC +5	<0.005	0.045	0.045	0.008
CADMIUM (CD) DIS	<0.001	<0.001	<0.001	<0.001
COPPER (CU) DIS	<0.004	<0.004	<0.004	<0.004
IRON (FE) DIS	<0.02	0.17	0.16	<0.02
LEAD (PB) DIS	<0.005	<0.005	<0.005	<0.005
MANGANESE (MN) DIS	<0.015	4.8	4.8	<0.015
ZINC (ZN) DIS	<0.02	<0.02	<0.02	<0.02

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; U1:Blank; J2,UJ2: Standard; J3,Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	SPAR-1	SPAR-2	SPAR-3
SAMPLE DATE	06/02/2003	06/02/2003	06/02/2003
SAMPLE TIME		:	12:45
LAB	ASARCO	ASARCO	TSC-SLC
LAB NUMBER	0306-226	0306-227	L030245009
REMARKS	SWL ONLY	SWL ONLY	
SAMPLE NUMBER	AEH-0306-226	AEH-0306-227	AEH-0306-171

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	33.5	33.76	33.8
OXYGEN (O) (FLD) DIS			0.08
PH (FLD)			5.92
PH			6.6
SALINITY (G/KG) (FLD) (ppt)			0.9
SC (UMHOS/CM AT 25 C)			1996.0
SC (UMHOS/CM AT 25 C) (FLD)			1940.0
TDS (MEASURED AT 180 C)			1424.0
TOTAL SUSPENDED SOLIDS			31.0
TURBIDITY (NTU) (FLD) (NTU)			1.0
WATER TEMPERATURE (C) (FLD)			11.8

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	81.0
MAGNESIUM (MG) DIS	35.0
SODIUM (NA) DIS	262.0
POTASSIUM (K) DIS	20.0
TOTAL ALKALINITY AS CACO ₃	72.0
BICARBONATE (HCO ₃)	88.0
CARBONATE AS CO ₃	<2.0
SULFATE (SO ₄)	705.0
CHLORIDE (CL)	132.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	20.0
ARSENIC +3	16.0
ARSENIC +5	<4.0
CADMIUM (CD) DIS	0.18
COPPER (CU) DIS	0.004 J
IRON (FE) DIS	10.0
LEAD (PB) DIS	<0.005
MANGANESE (MN) DIS	11.0
ZINC (ZN) DIS	7.3

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	STW-1	STW-2	STW-3
SAMPLE DATE	06/02/2003	06/02/2003	06/02/2003
SAMPLE TIME	11:45		
LAB	TSC-SLC	ASARCO	ASARCO
LAB NUMBER	L030245007	0306-228	0306-229
REMARKS		SWL ONLY	SWL ONLY
SAMPLE NUMBER	AEH-0306-169	AEH-0306-228	AEH-0306-229

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FRET)	33.07	33.44	32.71
OXYGEN (O) (FLD) DIS	0.11		
PH (FLD)	6.52		
PH	7.2		
SALINITY (G/KG) (FLD) (ppt)	1.2		
SC (UMHOS/CM AT 25 C)	2570.0		
SC (UMHOS/CM AT 25 C) (FLD)	2500.0		
TDS (MEASURED AT 180 C)	1807.0		
TOTAL SUSPENDED SOLIDS	8.0		
TURBIDITY (NTU) (FLD) (NTU)	4.0		
WATER TEMPERATURE (C) (FLD)	12.8		

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	69.0
MAGNESIUM (MG) DIS	17.0
SODIUM (NA) DIS	450.0
POTASSIUM (K) DIS	17.0
TOTAL ALKALINITY AS CACO ₃	192.0
BICARBONATE (HCO ₃)	234.0
CARBONATE AS CO ₃	<2.0
SULFATE (SO ₄)	831.0
CHLORIDE (CL)	171.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	25.0
ARSENIC +3	33.0
ARSENIC +5	<0.005
CADMIUM (CD) DIS	<0.001
COPPER (CU) DIS	<0.004 UJ
IRON (FE) DIS	0.39
LEAD (PB) DIS	<0.005
MANGANESE (MN) DIS	2.4
ZINC (ZN) DIS	0.16

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: GROUNDWATER --

SITE CODE	STW-4	STW-5	STW-6
SAMPLE DATE	06/02/2003	06/02/2003	06/02/2003
SAMPLE TIME	11:15		
LAB	TSC-SLC	ASARCO	ASARCO
LAB NUMBER	L030245006	0306-230	0306-231
REMARKS		SWL ONLY	SWL ONLY
SAMPLE NUMBER	AHH-0306-168	AHH-0306-230	AHH-0306-231

-- PHYSICAL PARAMETERS --

DEPTH TO WATER LEVEL (FEET)	32.05	31.9	32.16
OXYGEN (O) (FLD) DIS	0.26		
PH (FLD)	6.33		
PH	7.2		
SALINITY (G/KG) (FLD) (ppt)	1.1		
SC (UMHOS/CM AT 25 C)	2520.0		
SC (UMHOS/CM AT 25 C) (FLD)	2450.0		
TDS (MEASURED AT 180 C)	1718.0		
TOTAL SUSPENDED SOLIDS	46.0		
TURBIDITY (NTU) (FLD) (NTU)	4.0		
WATER TEMPERATURE (C) (FLD)	12.5		

-- MAJOR CONSTITUENTS --

CALCIUM (CA) DIS	70.0
MAGNESIUM (MG) DIS	18.0
SODIUM (NA) DIS	449.0
POTASSIUM (K) DIS	13.0
TOTAL ALKALINITY AS CACO ₃	187.0
BICARBONATE (HCO ₃)	228.0
CARBONATE AS CO ₃	<2.0
SULFATE (SO ₄)	851.0
CHLORIDE (CL)	168.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	19.0
ARSENIC +3	25.0
ARSENIC +5	<0.005
CADMIUM (CD) DIS	<0.001
COPPER (CU) DIS	0.011 J
IRON (FE) DIS	0.086
LEAD (PB) DIS	<0.005
MANGANESE (MN) DIS	2.7
ZINC (ZN) DIS	0.23

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank= parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

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43	EHC-0304-102	L030184003	04/30/2003PPC-5		34	L030256015	AHH-0306-213	06/04/2003EH-65	
43	EHC-0304-103	L030184004	04/30/2003PPC-5		33	L030256016	AHH-0306-214	06/04/2003EH-64	
44	EHC-0304-104	L030184005	04/30/2003PPC-103		27	L030256017	AHH-0306-215	06/04/2003EH-109	
43	EHC-0304-105	L030184006	04/30/2003PPC-3A		5	L030256018	AHH-0306-216	06/04/2003DH-2	
43	EHC-0304-106	L030184007	04/30/2003LOWER LAKE		42	L030256019	AHH-0306-217	06/04/2003SSTD	